Raising Recycling Awareness

Katie Meyer

December 2005

An Honors Thesis (HONRS 499)

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by

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Abstract

Environmental pollution has increasingly become a large problem throughout the globe. Community recycling programs started emerging in the 1980s and continue to increase in number across the United States. Efforts to recycle materials in the household have focused mainly on paper, plastic, and metal. Schools use an astounding amount of paper on a daily basis. Grissom Elementary, located in Muncie, Indiana, throws away hundreds of pounds of paper weekly. In order to increase environmental pollution awareness, I began a paper recycling program in my third grade classroom. I also taught a unit entitled "Saving the Environment" in order to introduce the notions of other environmental pollutants and bring awareness to some of the younger members of the Muncie community.

Acknowledgements

I want to thank Dr. Nina Yssel for advising me through this project. She was extremely helpful, patient, and encouraging throughout my project experience.

I would also like to thank Mary Hosier for allowing me to employ my thesis in our 3rd grade classroom.

I would also like to thank my 3rd grade students for being so enthusiastic and cooperative about this project, and also making it fun.

Raising Recycling Awareness

Environmental pollution has been a problem for decades. I grew up in a household that has recycled paper, plastic, glass, and metals for as long as I can remember. Every house on my block had one or two blue recycling bins that were put on the curb once a week, and were picked up the next morning by the local recycling company. Moving to Muncie to attend Ball State University brought many changes in my life, including my recycling habits. The recycling service that resides in Muncie requires citizens to go to a local hardware store (a large chain) and pick up blue plastic bags to recycle their materials. The "convenience factor" simply does not exist. There is a recycling plant in the community, but it requires one to bring in his recycling himself. It felt unnatural for me to throw an aluminum pop can in the garbage, or toss a newspaper in the trash.

When I began my student teaching experience at Grissom Elementary School in Muncie, I was horrified at the vast amount of paper that was being thrown away in the regular trash on a daily basis. In my third grade classroom alone, students would throw away countless workbook pages and worksheets every day. Thus, my Honors Thesis Project was born.

Grissom Elementary is located on the south side of Muncie, Indiana. It houses 433 students from kindergarten through fifth grade. Sixty nine percent of the students qualify for free or reduced lunch. I learned this statistic early in the semester, and realized a brazen fact very quickly: most of these students did not come from well-off families. I wanted to create an Honors Project that involved my students and their community. I wanted my students to be involved in

something that improved the quality of their lives, and let them discover that their actions can affect large groups of people in a positive way. I also had to take into account that this experience simply could not be of any monetary expense to my students or their families. I had originally wanted to create some type of canned food drive, until I realized that most of the canned food that would be collected from Grissom would go straight back to several of the Grissom students' families.

Taking all these matters into hand, I started to think about environmental pollution. After several weeks of research, talking to others, meeting with the principal of Grissom Elementary, meeting with my Supervising Teacher, meeting with my Honors advisor, and deliberation, I decided my Honors Thesis Project would consist of my students participating in a classroom recycling project. I discussed the idea with my students and they were thrilled. We set a goal of recycling 500 pounds of paper in five weeks. The students would collect paper at home every week and bring it to school on Fridays. We would then put it together with all the paper we had collected from our classroom at school during the week, weigh it, record it, and put it in plastic bags to be taken to the local recycling center.

I began to collect paper bags from Marsh groceries to send home with my students. I knew that our recycling project would probably be a greater success if my students had somewhere to put their collected paper from home during the week. We had a short discussion on what kinds of materials they could bring from home (focusing mostly on *clean* paper). I also created a recycling sign for my students to individually color and tape on their Marsh bags, to make each

recycling bag more personal to that student. I sent home a note to my students' parents and guardians, which explained our classroom paper recycling project and gave families an opportunity to participate in their child's education. I made sure to make it clear that it was not a requirement that students bring paper from home.

I brought in a scale for my students to use when we measured our paper, and I made a Tree Chart that would document how much paper we were recycling. I configured the tree so that the trunk would represent how much paper (in weight) the students had recycled. At the beginning of our project, we had a tree with green leaves and a white trunk. The more paper that our class recycled, the more we were able to fill in our trunk with brown marker. Once the trunk was filled in, we knew that we had recycled 500 pounds of paper.

After the beginnings of this project were getting into full swing, I began to think about *why* we were implementing this recycling project. I then realized that my students probably did not fully understand why they were recycling all this paper except "...because it's a good thing to do." The best way to get the students to understand why and realize the impact they were having on the community and the Earth was to teach them. I talked it over with my supervising teacher, Mary Hosier, and she agreed that it would be a good idea. I created a ten-lesson unit entitled "Saving the Environment" to correlate with my Honors Project. I decided that not only would I teach my students about recycling paper, but I would also delve into recycling other materials, air pollution, water pollution, land fills, food packaging, littering, and hazardous products. I felt my students would get a greater understanding of *why* if they knew about the different kinds

of pollution that exist, the impact that humans and man-made materials have on the Earth, what man can do about it, etc.

I began my Saving the Environment Unit by administering a unit pre-test. I created this pre-test myself, as I wanted to have more control over what my students were being tested on, plus I would be able to incorporate more information into it than from a generic book test. I wanted to get a good idea what my students knew about the environment. I discovered that my students did not know very much about environmental pollution or recycling. The highest score was a sixty percent, which is a grade of D-. Most students scored between twenty or forty percent. Despite the low scores, I was encouraged because I realized how much information I would (hopefully) be able to pass on to my students. I also decided that I would give a post test at the end of the unit. This way, I would be able to see how much my students had learned during my environment unit.

At Grissom Elementary, teachers are strongly encouraged (and sometimes required) to use the school textbooks that are provided in each classroom. I also knew that I would have to incorporate several of Indiana's Academic Standards into my unit. After browsing through the third grade science books, I found three lessons that I could tie in with recycling and saving the environment. The first lesson I taught in my unit was from my students' science books, entitled "What Are Resources?" (p. 241-249). We read aloud from the textbook together, and discussed the vocabulary words of the lesson. Only twenty-five minutes a day is allotted for science, so I had to go through most of my lessons very quickly. If I could have changed anything about my environment unit, it would be to allow

more time for it. The students were very excited about this first lesson, and the amount of questions they had for me was quite surprising. These were issues that the students could get involved in, which made them feel important. They were beginning to realize the importance of the environment in their lives.

The second lesson of my environment unit involved Dr. Seuss' "The Lorax." I read the book to the students, and we discussed it afterwards. This book by Dr. Seuss does a fantastic job of showing a community that was completely destroyed by a polluting factory. It ruined the environment, it ran all of the animals out, and the people eventually left. We talked about how the book applied to the world today and how it affected the students' lives. I also made an overhead entitled "Needs & Wants" and we discussed the differences between a need and a want. This lesson also included a "Needs & Wants" card game, in which the students grouped different items together and based everything on needs and wants. This book was a great (and fun) introduction to pollution and how damaging it can be on the environment.

The next lesson also came from the students' science books, entitled "How Can We Protect Our Resources?" (p. 250-253) We briefly discussed wetlands, soil and erosion, how to conserve water, why landfills are filling up, and alternatives to landfills. Since the students already had a vocabulary worksheet as an assignment two days earlier, I had them write out some of their vocabulary words in sentences to ensure understanding. We also went over renewable and nonrenewable resources and came up with examples of each.

I was a little nervous about the next lesson, mainly because it involved students making their own landfills. I had been collecting empty plastic milk

containers for a couple weeks, since each student needed their own. We had briefly discussed landfills and how they worked in a previous lesson, so this lesson was building upon that base knowledge. I also had a quick discussion with the students about behaving while making these projects, as they involved several steps and garden dirt (potentially messy). The landfills were made together as a class. This process not only exercised more control, but it allowed time for discussions about particular aspects of the landfills. We talked about landfill overflow, and how paper contributed to almost forty percent of materials in landfills. This led to student self-discovery that *that* was why people recycled paper, metals, and plastics, and *that* was why we were conducting a paper recycling project! We talked about recycling and how it led to less garbage in landfills, which would benefit every living thing.

The next lesson was the last segment from my students' science books, entitled "What Are Ways To Use Resources Again?" We read about recycling many different materials, and why recycling is beneficial to the Earth. This lesson also tied in very nicely with our recycling project, as it began to give the students more of an idea of the concept of recycling and how it occurred. We also discussed coming up with new items by reusing old items. I gave the students a homework assignment for that evening to create an art project out of anything (clean) from the garbage in their houses. The point was to *reuse* and *recycle* materials. I did not give the students much guidance beyond that, except continually stressing that the garbage should be clean. I wanted the students to express their creative abilities, instead of getting ideas from me or from classmates. The student art projects that came into the classroom the next day

were unbelievable. Obviously several had help from their parents, but the creativity levels really astounded me. The students were extremely proud of themselves, and we had a short show-and-tell session about all of the art projects. I also made sure to stress that the art projects were made out of old materials, meaning they had been reused and recycled. The students began to pick up on the fact that they were assisting the Earth by reusing and recycling old materials.

I was also nervous about the next lesson. I knew it would be fun for the students, but I was hoping it would not be out of control. This lesson involved making recycled paper. Each student had the opportunity to make his own piece of recycled paper. The students were very excited when I told them about this project. Our students do not have many opportunities to do something other than worksheets in class and as homework, so I had a feeling they would enjoy this activity. I had students help me pass out materials and we began the project together. It surprised me that it took a long time for them to rip up their newspaper into little bits, but some were being too careful, some were ripping pieces too large, etc. I think the best part of the project was that each student got to make his own recycled paper. As we were doing these projects together, I initiated discussions about recycled paper and the process that paper must go through in a recycling plant. It took twenty-four hours for their recycled paper samples to dry, but the students were just as excited about their paper the following day when they got to take it home.

Rating a lunch bag also turned out to be more of a success than I originally thought. On a typical day, only two or three students will bring their lunch from home, while the rest get school lunches (and most get free school lunches, at

that). I asked my students to see if they could bring in a lunch from home the following day, and anticipated on having enough lunches to put my students in groups of five. The day of this lesson, I had twelve or thirteen lunches brought in from home. I was shocked. I put the students in groups of two, and everyone was able to inspect a lunch much more closely than I had originally thought. After filling out their worksheet, the class was able to launch into a discussion about cutting down on food packaging and the amount of things we throw away every day.

Carrying out the litter hunt was also a huge success in our classroom. I actually had to bump this lesson to almost the end of the unit because of inclement weather, but we finally got a decent day for the students to go outside and pick up litter around their playground area. The students were excited about getting to wear plastic gloves and made the pick-up a competition amongst them. I was a little concerned that something inappropriate would be found on the ground; I think a student finding a used contraceptive was my biggest apprehension. That particular item was not found, but a pair of boy's underwear was found, which sent my classroom into a fit of giggles. I was so relieved it was not something worse. The students piled all of their garbage together in our classroom and I held various items up. We discussed what it probably was, where it came from, how it might have gotten there, etc. The students not only enjoyed this activity immensely, but they were able to improve the environment of their playground area behind Grissom Elementary.

The second part to this lesson involved overheads of wildlife that had been affected by litter. Even though the pictures were just drawings, the visual aid and

the thought of the travesties that littering can cause made two of my students get a little teary. I felt terrible, but it was comforting to know that my lesson had so deeply affected my students, and I knew it would stick with them for a long time.

After the reaction I got from my students with the wildlife and the litter, I had a feeling that the lesson about oil spills would also affect them. The demonstration for my "ocean in a bottle" turned out really well, and the students really seemed to enjoy watching me create an oil spill, a chemical spill, and an oil and chemical spill. We had a class discussion about how these spills would affect humans, wildlife, and the environment. I did some research on oil spills before this lesson, and came up with quite a bit of information. I decided to really focus on the tragedy of the *Exxon Valdez*, as it was a massive oil spill that happened off the coast of the United States within the last twenty years. I borrowed a couple books from the library that contained several great pictures of the oil spill and its effects, because I knew the students would get a better feel for the vastness of the spill if they saw real pictures. Once again, I had several students who were extremely upset about the thousands of animals that were injured or killed, but I knew that the lesson was effective. The assignment that I applied to this lesson was for my students to pretend that they were in Alaska when the *Exxon Valdez* accident occurred. They had to write a postcard home about what they saw, what they were feeling, how they were going to help, and anything else they wanted. The postcards turned in the following day were very well thought out and included some great drawings of the oil spill.

The last lesson of my unit was about hazardous products. I carried out a demonstration about the words *caution, warning,* and *danger*. I also led a class

discussion on products in the home that could be hazardous if used or disposed of incorrectly. Out of all the lessons in this environment unit, I was probably the most worried about the students comprehending this one. The demonstration could have been slightly confusing, but the students seemed to pick up on the concepts rather quickly. I had a handout for them to take home and post on their refrigerators, which contained a list of hazardous products substitutes that could be used in the home. We also discussed dumping chemicals into storm drains, and followed the path of water from toilets, sinks, washing machines, and storm drains into the river. I found a maze that the students could complete that followed the paths of water into the river, which the students seemed to enjoy. At the same time, this maze reinforced several of the ideas I had taught the students about water drainage. I also had an overhead that went over routes of exposure to chemicals. We discussed ingestion, inhalation, and absorption of chemicals, and how to prevent those three things from happening.

After the tenth lesson from my environment unit was taught, I created a review game for my students. Due to weekends, the fact that our classroom does not have science on Fridays, and Thanksgiving, my ten-lesson unit was spread over a few weeks. I had a feeling the students would need to review everything they had learned about the environment, otherwise they probably would not have done quite as well on their unit tests. The review game went quite well, as most students got the answers correct and we were able to hold small discussions about some of the ideas. I created the unit test using the same questions that were on the pre-test, as I wanted to be able to document and graph each student's progress from the beginning to the end of the unit.

Although not all of my students passed the unit test, one hundred percent of them improved from the pre-test to the post test. I graphed the results and wrote a brief discussion of those results, noting which questions received the most incorrect responses, and vice versa. Only two students did not pass the unit test, while fourteen received an A or a B. On the whole, it seems that my students really enjoyed my unit. I feel that the greatest success from my unit was that I taught my students *why* we had created this paper recycling project. I made them aware of several environmental issues, and that each individual can have an impact on the environment of the Earth.

The paper recycling project lasted a little over five weeks in our classroom. In the first week, I had to review with my students what they could bring in for our project (we got plastic, aluminum, and batteries in with our paper). The paper started rolling in after that. Some weeks, our recycling boxes got so heavy that we had to split up the weight because the students were not able to hold the boxes while standing on the scale. A few teachers heard about our project and brought in some paper from their homes, which really increased the motivation of my students. On December fourteenth, the day before the last day the students could bring in their paper for our project, we reached 511 pounds of recycled paper. The students were ecstatic, and brought even more in the following day. Our third grade class ended up recycling 594 pounds of paper. Not only did our class recycle all that paper, but also the students were able to return to their homes and educate their families. One hundred percent of the students in my class participated in this recycling project, which I feel is one of the great successes of this Honors Thesis project.

One of the parts of my initial Honors Thesis idea was to plan a field trip to the local recycling plant. If there were anything I could alter about our recycling project, it would be the outcome of our field trip. After quite a bit of research, I discovered that the local recycling plant had field trips available to groups, including school classrooms. I thought this would be a great opportunity for the students to get a first-hand experience at the actual process of recycling paper, plastics, and metals. After a few unanswered phone calls over several days, I finally connected with an individual at the recycling plant. I explained my project and situation to him, and he told me that they only offered field trips for students older than sixth grade. I was greatly disappointed, and told him that I understood his policy, but I would only be bringing in twenty-one students at the most, along with three chaperones (another student teacher agreed to attend). I also informed him that my Cooperating Teacher ran an extremely strict classroom and I could assure him there would be no disciplinary problems. The individual chuckled a bit, said he would think about it, and get back to me in a bit. Two weeks later, I still had not heard from him.

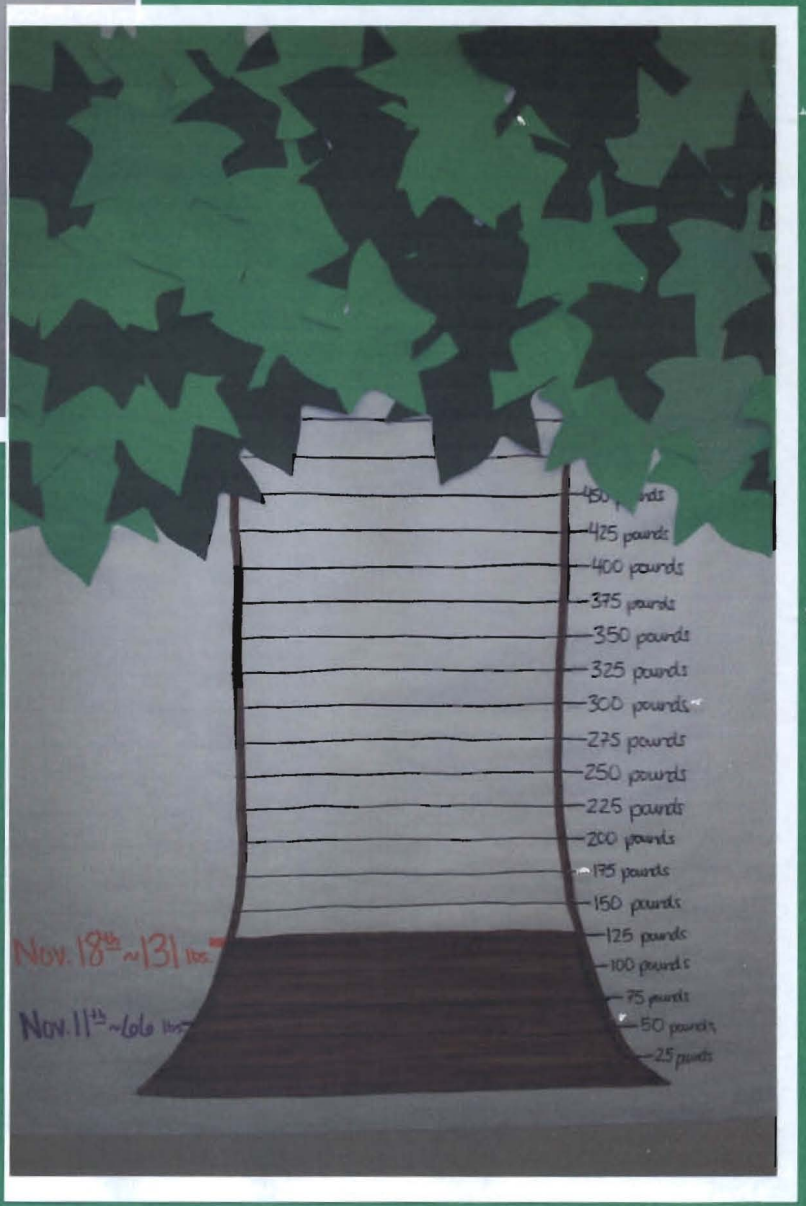
I tried calling the recycling plant again, and after a few days, I talked to the same individual and heard the same speech, and "...I'll get back to you in a few days." That did not happen. So a week later, I called again to see if there was any way we could get a speaker into our room, as it was becoming too late to plan a field trip. The same individual told me he would talk to a woman at the Muncie Sanitary District and that she would call me. I took it upon myself to call that woman, as I was not going to hold my breath on her getting the message through that individual at the recycling plant. I left her a message about getting a speaker

for our classroom, and she returned my call a few days later. In the message, she enlightened me by saying that the individual at the plant must have been misinformed, and that there was no age requirement for the recycling center tour. This frustrated me a great deal. I called her back and left a message, asking if there was any way we could get a speaker about the plant, as it was almost the end of the semester and our students did not have time to go on a field trip. Unfortunately, I never heard back. I talked it over with my Cooperating Teacher, and she felt that although it was disappointing, she thought my unit was going so well and the students were responding so positively that it would not greatly hurt anyone if the matter were just dropped. I wish the field trip or speaker would have worked out, but I was simply not getting the cooperation I needed from the local recycling plant.

Overall, I feel my Honors Thesis recycling project was a success. My students achieved their goal of recycling 500 pounds of paper. Every student participated, as did their families. In my opinion, our classroom conducting this recycling project reached and educated at least twenty-one families in the Muncie community, if not more. My third-grade students are more aware of the environmental pollution problems that exist in the world. My greatest hope is that these students carry and spread the knowledge of being able to help with them for the rest of their lives.

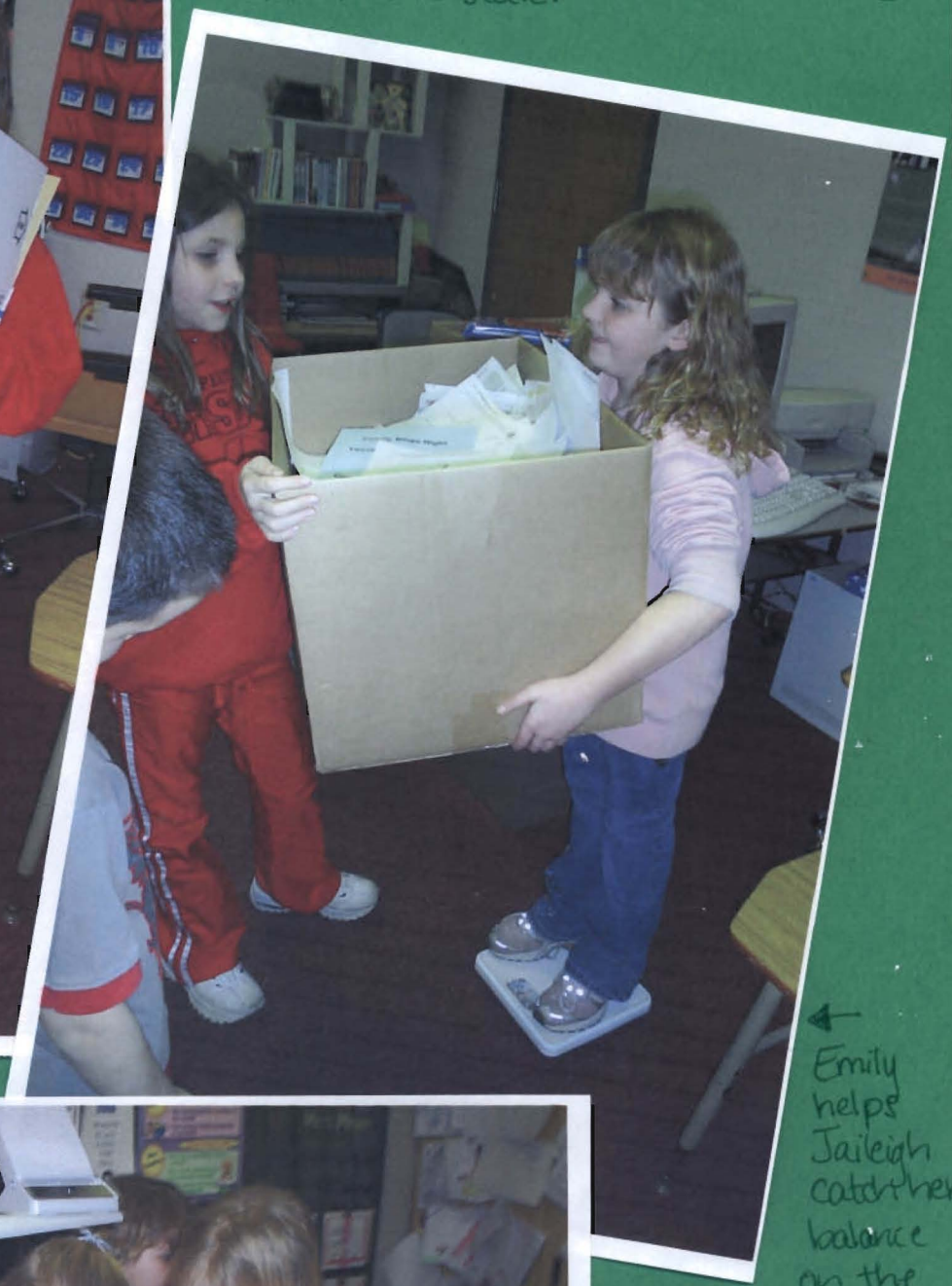
Our Recycling Project

The display outside our third-grade classroom.

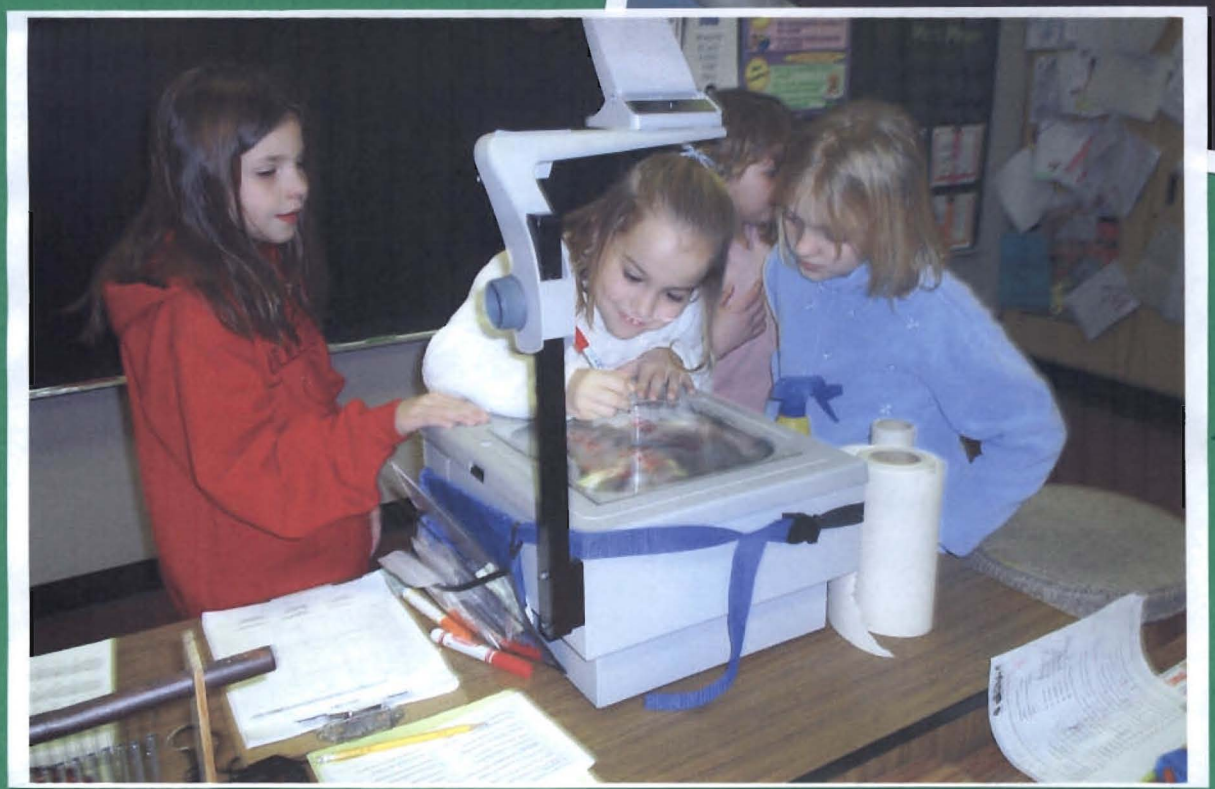


A close-up of our recycling tree.

Emily weighs the paper while Jaileigh checks the scale.



Emily helps Jaileigh catch her balance on the scale.



Emily and Heather watch Kerrigan add the weight of all the recycled paper for that week.

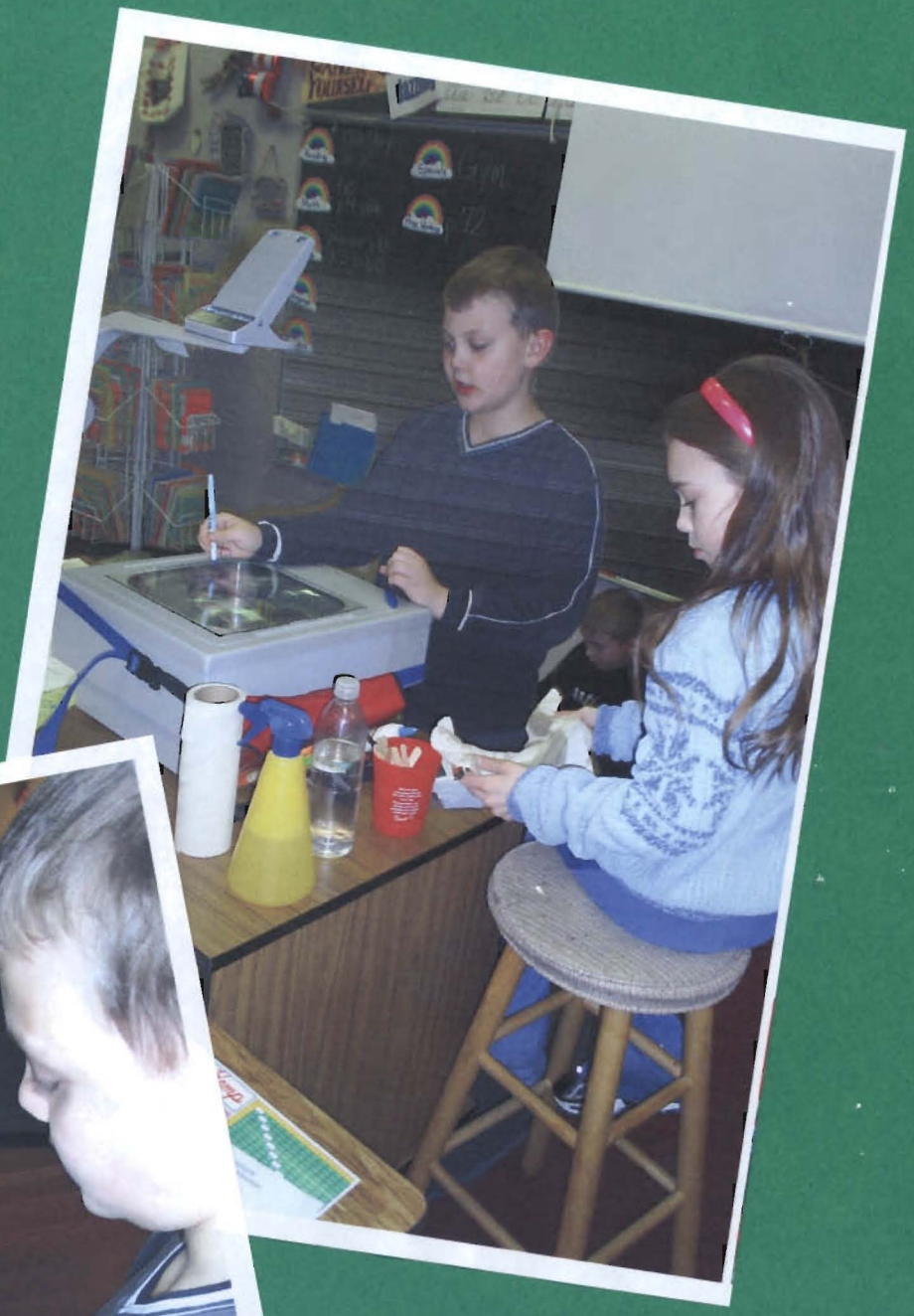
Jaileigh and Andrew (below) update the recycling tree.

Taylor F. updates the tree to December second, as Taylor K. and Shyenne watch.

← Tristan balances a large stack of paper while Ber checks the weight.

errigan, Molly, and
ileigh pose with some
aur paper.

Tristan works on calculating the paper weight.



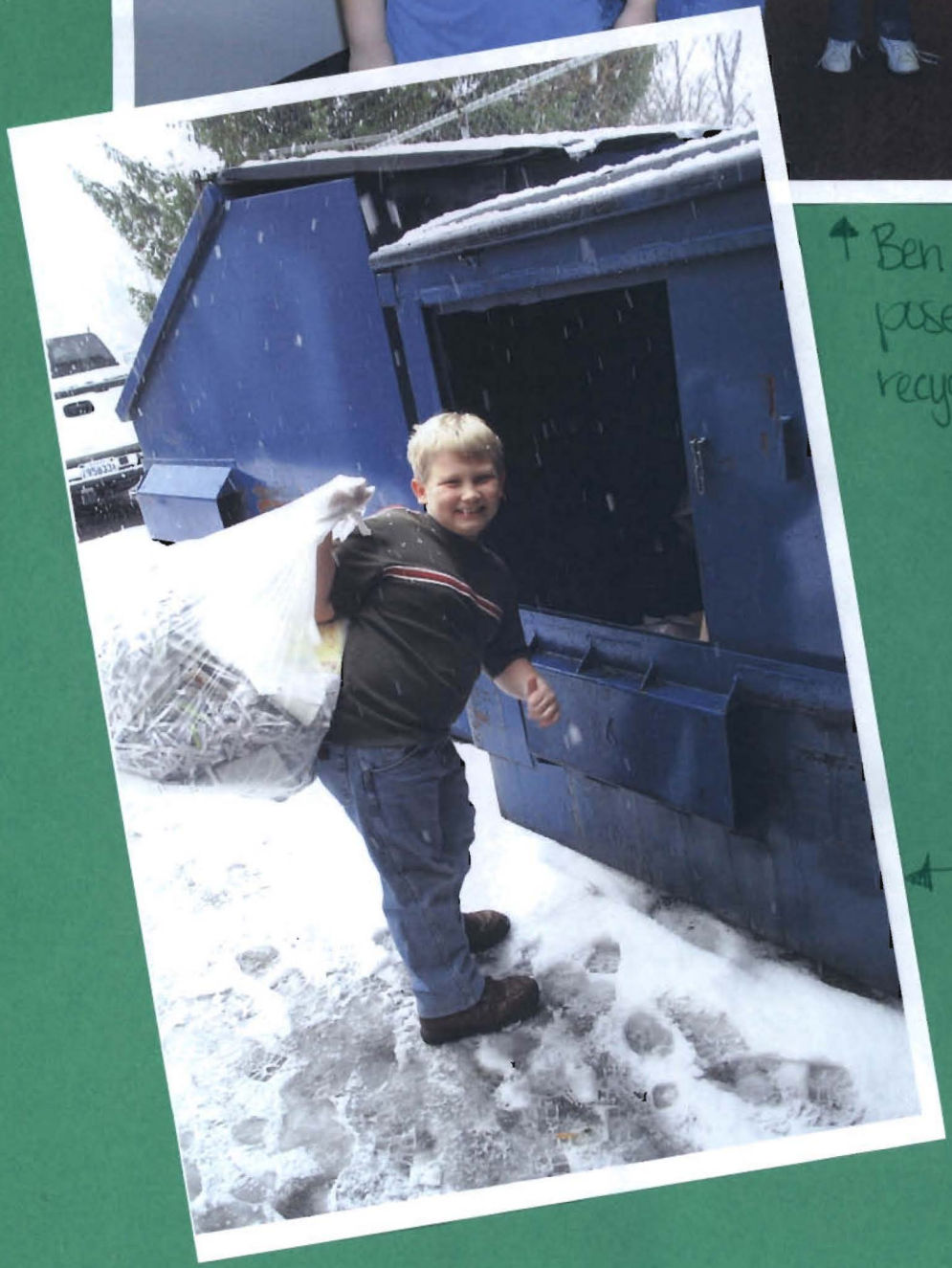
Molly holds the paper o
She weighs herself, as
Kerrigan reports her weig

Kerrigan calculates the
weight of the bag of
papers that Molly was
holding.

Ben and Tristan (below) continue to fill in the recycling tree.

Mike fills in the rest of the classroom recycling tree, indicating our class recycled 500 pounds of paper.

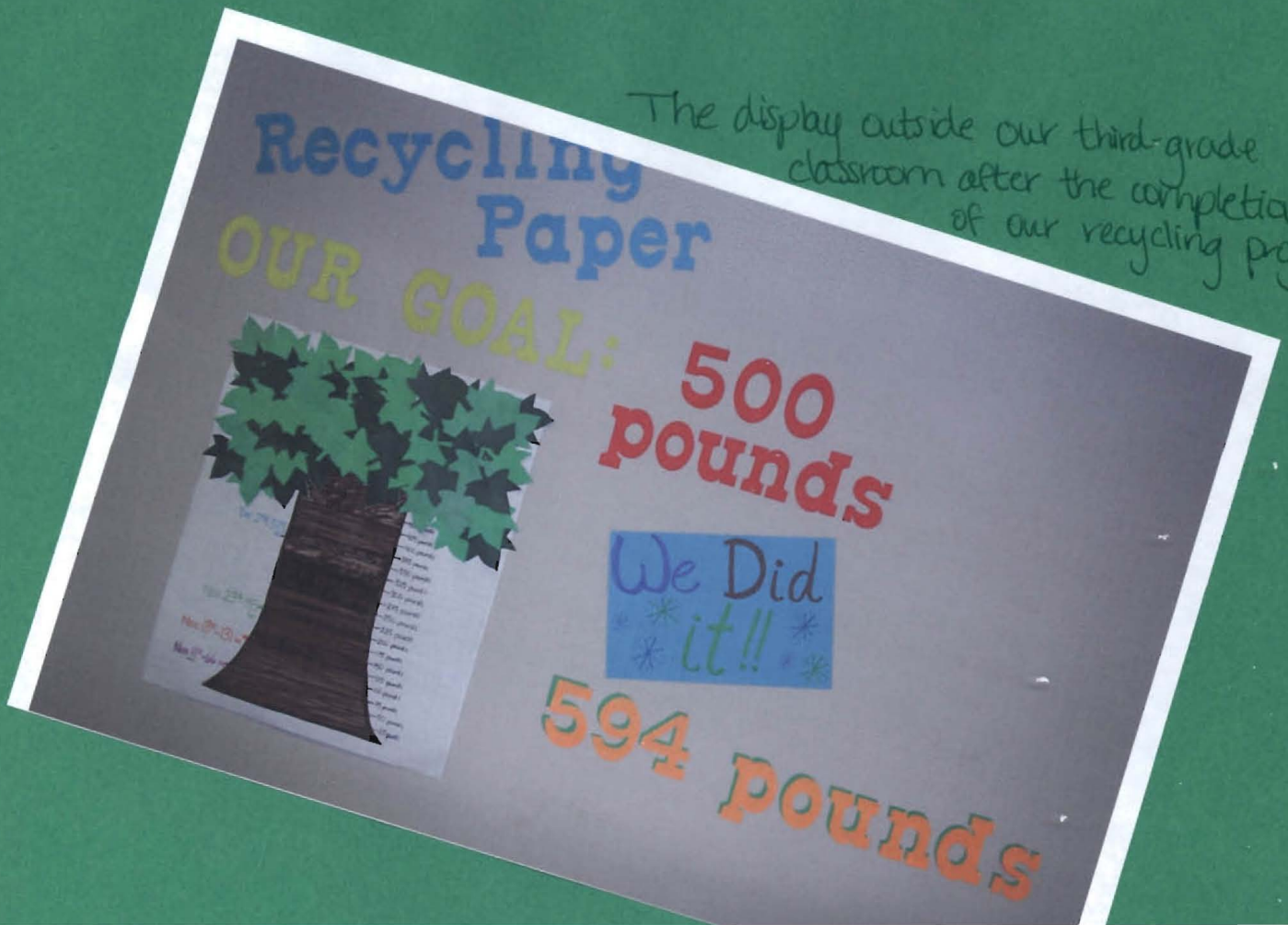
↑ Ben, Nicholas, and Taylor K. pose with the last load of recycled paper.



← Nicholas gets ready to toss a bag of recycled paper into the school recycling bin.

Taylor K. and Ben (below) show off the last loads of recycled paper from our classroom project.

Ben dur
the last
of recycl
paper in
the recycl
bin.



The display outside our third-grade classroom after the completion of our recycling project.

TEACHER GUIDE

Trash Talk!

MUNCIE COMMUNITY SCHOOLS
GRISSOM ELEMENTARY
GRADE 3
STUDENTS

TO: Teachers

FROM: East Central Indiana Solid Waste District
2031 Mounds Road • Anderson, Indiana 46016
765-640-2535 or 800-863-2793 • eciswd@sbcglobal.net • www.eciswd.org

DATE: Fall 2005

Welcome to the 2005-06 school year of *Trash Talk!* Our themes for this issue are yard waste, buying recycled, and America Recycles Day, which will be celebrated nationally on November 15. Our activities reflect these topics. Because these activities are cross-curricular, we have given you many ideas to fit the needs and interests of your students.

This Teacher Guide supplements *Trash Talk!* by giving extension activities, as well as by listing specific activities, subject areas covered, and skills addressed. Journal and reuse ideas can be quickly implemented as daily work supplements to the proficiencies that you teach every day.

Activity	**Subject Areas**	**Skills Addressed**
"And Your Point Is?"	Language Arts	Identifying the author's main purpuse
"Your Choice"	Math	Selecting the correct number sentence based on a word problem & Computation
"Searching for Recycling Success"	Science	Understanding the cycle of materials through the production process & Expanding vocabulary of terms related to recycling materials
"Professions for the Planet"	Social Studies	Identifying job titles based on a description of the work performed
	Language Arts	Decoding scrambled words based on context cues
"Compost Mix-Up"	Science	Demonstrating an understanding of how stages of a process relate to one another and the negative outcome related to a missed or misplaced step

While we believe we have created age-appropriate, high-interest activities, we welcome your thoughts and comments. Remember that *Trash Talk!* is produced locally to meet our needs in educating students about waste reduction and recycling. Please contact us with your suggestions or questions.

Reuse Ideas

Math

- ☐ The first America Recycles Day was held in 1997. Which America Recycles Day will we celebrate in 2005 (first, fifth, etc.)?
- ☐ Write <, >, or = in the circle.

  15 x 3 ○ 2 x 15 15 - 12 ○ 27 - 15

  27 - 12 ○ 3 + 12 27 + 3 ○ 15 + 16

Language Arts

- ☐ Correct this sentence:

  During the weakend, 15 families picked up much from the compost centre.
- ☐ Circle all of the adjectives in "Compost Mix-Up."
- ☐ Write the plural form of these words: appliance, bottle, fleece, newspaper, tile.
- ☐ Write these words in **ABC** (alphabetical) order:

  close cans chasing carpet cardboard

Analogies

- ☐ farmer : crops :: _____ : trees
- ☐ steel : appliances :: _____ : jars

Social Studies

- ☐ Circle the correct answers:

A landfill operator works at a _____.	landfill	store
A writer works on a _____.	TV	computer
A forester might work in a _____.	nursery	pool

Science

- ☐ Cross out the word that does not belong:

  appliance carpet factory fleece tile

Journal Writing Prompts

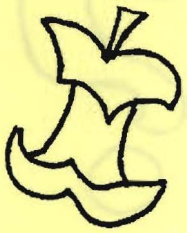
- ☐ Write a sentence using these words and phrases: students, worms, vermicomposting, and teacher.
- ☐ Write two paragraphs from the perspective of a daily newspaper. You might describe what the newspaper sees, who it meets, what it has to say, etc. Be creative!
- ☐ Name and describe two jobs that you think would be stressful. Do you think any of the jobs in "Professions for the Planet" would be stressful? If so, why and how?
- ☐ Create a sentence that contains a scrambled word or phrase. See if your neighbor can unscramble it.

Goin' on a compost hunt

Fall is a great time to enjoy the outdoors and learn about what items will biodegrade (rot) and which will not. Understanding which materials biodegrade helps students understand how to compost and vermicompost. Take your students outdoors for a "Compost Hunt." Copy the blackline master on the next page and provide a copy to each student or group. Have them check off each item they find. After they return to the classroom, ask them to circle all of the biodegradable items. Talk about what happens to non-biodegradable items in a compost pile or left outdoors as litter.

Goin' on a compost hunt

Check off each of the items that you find while you are outdoors on your "compost hunt."

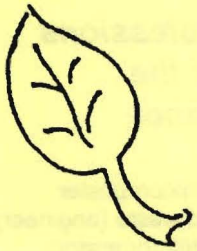


❑ Orange peel

❑ Apple core

❑ Banana peel

❑ Rotting fruit (or vegetable)



❑ Fresh weed

❑ Grass

❑ Leaf

❑ Newspaper

❑ Cardboard

❑ Twig or branch

❑ Plastic wrapper

❑ Fast food cup

❑ Drink bottle

❑ Bottle cap

❑ Stone or rock

❑ Other: _____

Circle the items above that will biodegrade (rot).

Teacher Keys

And Your Point Is?

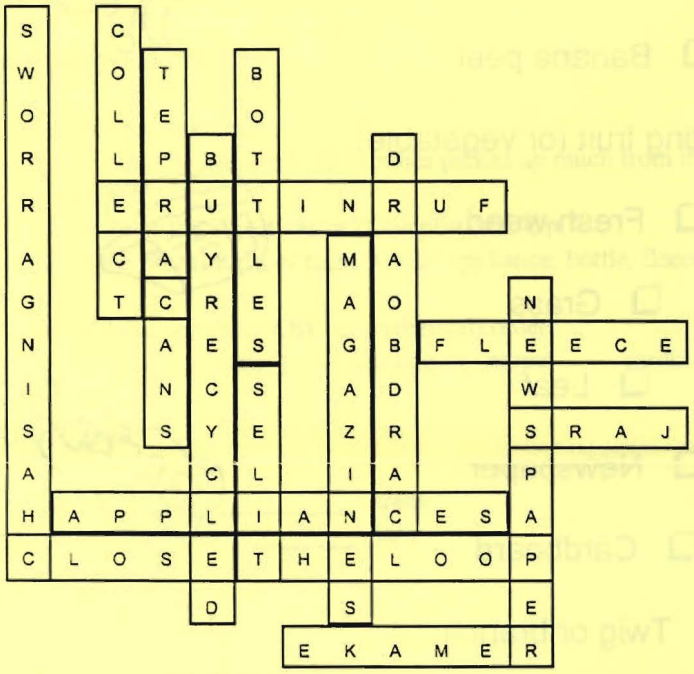
The purpose of this paragraph is to ENTERTAIN.

Your Choice

15 + 12 = 27 families

27 x 3 = 81 cubic yards of mulch

Searching for Recycling Success


SWORRAGNISAH
CLOSET
COLLECT
TEPEE
BUTANE
BOTTLE
RECYCLE
SCISSORS
BOTTLE
MAGAZINE
DRAIN
FLOOR
FLEECE
SWEATER
SWEATER
JEANS
APPLIANCE
DRAPE
DRAPE
DRAP

Science Unit

Saving The Environment

Katie Meyer
3rd Grade

Saving the Environment
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Environment Unit Standards

Science Standard 1 ~ The Nature of Science and Technology →
Students, working collaboratively, carry out investigations. They question, observe, and make accurate measurements. Students increase their use of tools, record data in journals, and communicate results through chart, graph, written, and verbal form.

Scientific Inquiry 3.1.2 → Participate in different types of guided scientific investigations, such as observing objects and events and collecting specimens for analysis.

Scientific Inquiry 3.1.3 → Keep and report records of investigations and observations using tools, such as journals, charts, graphs, and computers.

Scientific Inquiry 3.1.4 → Discuss the results of investigations and consider the explanations of others.

The Scientific Enterprise 3.1.5 → Demonstrate the ability to work cooperatively while respecting the ideas of others and communicating one's own conclusions about findings.

Technology & Science 3.1.8 → Describe how discarded products contribute to the problem of waste disposal and that recycling can help solve this problem.

Science Standard 3 ~ The Common Themes →

Students work with an increasing variety of systems and being to modify parts in systems and models and notice the changes that result. They question why change occurs.

Models and Scale 3.6.3 → Explain how a model of something is different from the real thing but can be used to learn something about the real thing.

Science Standard 4 ~ The Living Environment →

Students learn about an increasing variety of organisms. They use appropriate tools and identify similarities and differences among them. Students explore how organisms satisfy their needs in typical environments.

Human Identity 3.4.8 → Explain that some things people take into their bodies from the environment can hurt them and give examples of such things.

Science Standard 6 ~ Common Themes →

Students work with an increasing variety of systems and begin to modify parts in systems and models and notice the changes that result. They question why change occurs.

Systems 3.6.1 → Investigate how and describe that when parts are put together, they can do things that they could not do by themselves.

Systems 3.6.2 → Investigate how and describe that something may not work if some of its parts are missing.

Models and Scale 3.6.3 → Explain how a model of something is different from the real thing but can be used to learn something about the real thing.

Constancy and Change 3.6.5 → Observe that and describe how some changes are very slow and some are very fast and that some of these changes may be hard to see and/or record.

Language Arts Standard 2 ~ Reading Comprehension →

Students read and understand grade-level-appropriate material. They use a variety of comprehension strategies, such as asking and responding to essential questions, making predictions, and comparing information from several sources to understand what is read. In addition to their regular school reading, at Grade 3, students read a variety of grade-level-appropriate narrative (story) and expository (informational and technical) texts, including classic and contemporary literature, poetry, children's magazines and newspapers, reference materials, and online information.

Comprehension & Analysis of Grade-Level-Appropriate Text 3.2.7 → Follow simple multiple-step instructions.

Language Arts Standard 5 ~ WRITING: Writing Applications →

Students continue to write compositions that describe and explain familiar objects, events, and experiences. Students write both informal and formal letters. Student writing demonstrates a command of Standard English and the drafting, research, and organizational strategies outlines in Standard 4 – Writing Process. Writing demonstrates an awareness of the audience and purpose for writing.

- Write descriptive pieces about people, places, things or experiences that:
  - develop a unified main idea
  - use details to support the main idea.

Unit Pre-Test

Unit Pre-Test **Name:** _____

The Environment

Vocabulary

Directions: Write the letter of the correct answer on the line. Use each word once.

____ **1.** Trees, iron ore, water, and air are each a ____.

____ **2.** A natural resource that can be replaced in a fairly short period of time is a ____.

____ **3.** When we change something so it can be used again, we ____ it.

Vocabulary
A conservation
B natural resource
C nonrenewable resource
D recycle
E renewable resource

____ **4.** A resource that cannot be replaced once it is used up is a ____.

____ **5.** The saving and wise use of Earth's resources is called ____.

Environment Concepts

Directions: Write the letter of the BEST answer on the line.

____ **6.** Using "The Three *R*'s" is a good way to help protect the environment. Which of the following words does <u>not</u> fit in "The Three *R*'s" category?

A. reduce
B. reuse
C. rewind
D. recycle

____ **7.** A large area where trash is buried is called a ____.

A. recycling plant
B. landfill
C. fertilizer
D. green house

____ **8.** Which of the following materials cannot be recycled?

A. Styrofoam
B. glass
C. paper
D. plastic

____ **9.** Which of the following materials can be recycled?

A. baby diapers
B. batteries
C. bleach
D. pop (or soda) cans

____ **10.** Which of the following items is most likely to be a hazard to people or the environment if used or thrown away incorrectly?

A. cereal
B. flowers
C. pop (or soda)
D. drain cleaner

____ **11.** How long does it take for a plastic jug to decompose?

A. 1 year
B. 10 years
C. 100 years
D. 1,000,000 years

____ **12.** How long does it take for a banana peel to decompose?

A. 1 day
B. 3-4 weeks
C. 10 months
D. 2 years

____ **13.** What is pollution?

A. cleaning up the environment
B. really loud music
C. making something dirty or unsafe for life
D. studying the environment

____ **14.** Which of the following liquids will not mix with lake water?

A. salt water
B. Coca-cola
C. orange juice
D. motor oil

____ **15.** Litter is ____.

A. waste that is out of place.
B. a nonrenewable resource.
C. good for the Earth.
D. a type of energy.

Critical Thinking

Directions: Answer the questions on the lines provided.

16. Name a nonrenewable resource.

_____

17. Give an example of what old car and truck tires can be recycled in to.

_____

18. Think about the book *The Lorax*. List two problems the thneed factory caused for the environment.

_____

_____

19. Think about the book *The Lorax*. What ended up happening to the Lorax?

_____

_____

20. If a person litters and throws the plastic ring from the top of a bottle of soda next to a river, what can happen to an animal that finds that plastic ring?

_____

_____

Unit Pre-Test

The Environment

Name: Heath

-16 36%

Vocabulary

Directions: Write the letter of the correct answer on the line. Use each word once.

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D 5. The saving and wise use of Earth's resources is called ____.

Vocabulary
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B. natural resource
C. nonrenewable resource
D. recycle
E. renewable resource

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plaice

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tire swings

X 18. Think about the book *The Lorax*. List two problems the thneed factory caused for the environment.

Smoke, brake

X 19. Think about the book *The Lorax*. What ended up happening to the Lorax?

Thneesshop operapolagia

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Ft code kill it

X

Unit Pre-Test

The Environment

Name: Tristan

-20 20%.

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Colored
cans

X 19. Think about the book *The Lorax*. What ended up happening to the Lorax?

I Dan know.

X 20. If a person litters and throws the plastic ring from the top of a bottle of soda next to a river, what can happen to an animal that finds that plastic ring?

Can it will b

Lesson #1

What Are Resources?

Lesson #1

What Are Resources?

Materials:

- Scott Foresman Science textbook, Grade 3, pages 241-243, 247-249, one per student [attached]
- Vocab Preview worksheet, one per student [attached]

Objective/Academic Standard:

Science Standard 6 ~ Common Themes → Students work with an increasing variety of systems and begin to modify parts in systems and models and notice the changes that result. They question why change occurs.

Constancy and Change 3.6.5 → Observe that and describe how some changes are very slow and some are very fast and that some of these changes may be hard to see and/or record.

The student will be able to define the chapter's vocabulary words with at least 80% accuracy.

Motivation:

I will begin this unit on the environment by asking the students if any of them can define what the word "environment" means. I will also ask them what composes an environment (or makes up an environment), which will lead to the environment affecting all living things. I will then move on to having the students guess what a natural resource is, as well as seeing if they can come up with any examples.

Goal for Learner:

The goal for the learner for this lesson is that the student will be able to define and give examples of natural resources, renewable resources, and nonrenewable resources.

Content and Procedures:

Teacher Content: A natural resource is an important material from the Earth that living things need. A renewable resource is a resource that can be replaced in a fairly short amount of time. A nonrenewable resource is a resource that cannot be replaced.

Procedure:

- I will have the students open their science books to page 241, which is the beginning of Chapter Nine. Read "You Will Discover" together and discuss.
- We will then turn to pages 242-243. We will talk about the vocabulary words for this chapter, and identify the picture that corresponds with each vocabulary word. We will also discuss and give examples of natural, renewable, and nonrenewable resources. We will also talk about how we will be learning about conservation and recycling later in the chapter.
- I will have the students read pages 247-249 silently, while I read aloud. This is in the interest in time, and also to cater to the needs of visual and auditory learners. We will periodically stop during the reading for spontaneous discussions on what we have read, such as the importance of trees, how nonrenewable resources are running out (and what are we going to do about it?), examples of resources that come in endless supply, etc.

Accommodations for all special education students:

- Give directions one at a time.
- Check for understanding.
- Repetition of directions.
- Restate directions for clarification.
- Extended time for assignments.

Practice/Application:

I will pass out the Vocabulary Preview worksheet to each student. If there is time, I will give the students an opportunity to start their homework during class. This worksheet is to be turned in the following day.

Evaluation of Student Learning:

I will grade and record the grades of the students' work on the Vocabulary Preview page. This page will demonstrate whether the student can define this chapter's vocabulary words with at least 80% accuracy (or 4 out of 5 correct).

Closure:

I will ask the students, "Who can give me an example of a renewable resource? How do you know it's renewable?" and "Who can give me an example of a nonrenewable resource? How do you know that?" I will review that a natural resource is an important material from the Earth that living things need.

Evaluation of Lesson: Personal Reflection

I feel that today's lesson went fairly smoothly. The students seem very excited about our environmental unit; especially our proposed recycling project. Before I began the lesson, I was a little concerned about the chapter vocabulary: *natural resource, renewable resource, nonrenewable resource, conservation,* and *recycling*. Some of those words seem awfully big for third graders! But the students seemed to pick up on the words well today, especially after we went over some examples. I think my favorite part about today's lesson was that these are issues that our students can really get involved in, which makes them feel important. Something I would like to improve on is less of the lesson time spent with me reading from the book, and more of the lesson time used on classroom discussion of topics related to what we have read. The students love to contribute and ask questions, and I really hope to be able to fit more of *that* into our lesson, instead of the stereotypical read-the-pages-and-do-your-homework routine.

Chapter 9

Natural Resources

You Will Discover

241

Natural Resource

Science Objectives

- The student recognizes the costs ar society and the environment posed b of nonrenewable energy.
- The student knows that reusing, rec reducing the use of natural resources and protect the quality of life.
- The student knows that it is importa keep accurate records and descriptio provide information and clues on ca discrepancies in repeated experimen

Quick TEACHING PLAN

If time is short...

Do the Explore Activity and How to Re lesson on pages 244–245 to engage s the chapter content. A discussion of pa 248, 250, and 257 will familiarize stu the content of the chapter. The rest of t can be completed by the students inde

Professional Development

To enhance your qualifications in science:

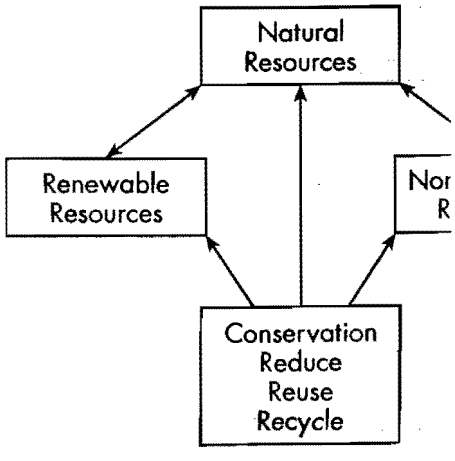
- preview content in Earth Science DVD Segment *Natural Resources and the Environment.*
- preview activity management techniques described in Activity DVD Unit B, Chapter 9.

Take It to the NET

To access student resources:

1. Go to **www.sfsuccessnet.com**.
2. Click on the register button.
3. Enter the access code **dolphin** and your school's zip code.

Chapter 9 Concept M



Students can create a concept map to ideas about natural resources.

Build Background

Science Objective

- The student uses simple strategies to determine meaning and increase vocabulary for reading, including the use of prefixes, suffixes, root words, multiple meanings, antonyms, synonyms, and word relationships.

Chapter 9 Vocabulary Words

natural resource, p. 247
renewable resource, p. 247
nonrenewable resource, p. 248
conservation, p. 250
recycle, p. 254

1 Introduce the Concept

Ask students to name all the words they know about natural resources. Have students tell what they think these words mean.

List the vocabulary terms on the board. Discuss the meaning of each vocabulary term and how it relates to materials from the Earth that living things need.

Guide students to examine the picture that illustrates each vocabulary term.

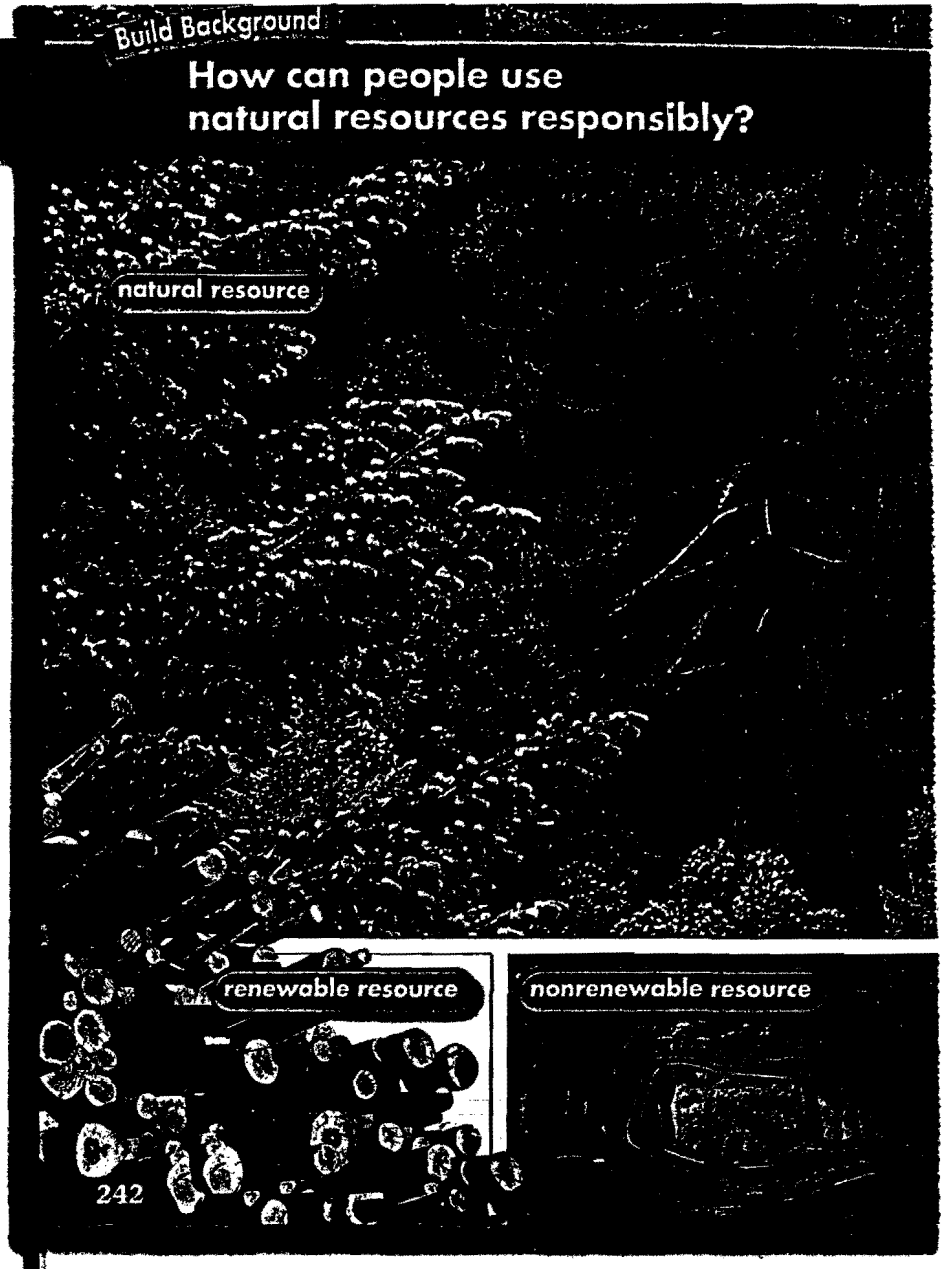
Questions such as the following will help students express their understanding of the vocabulary terms.

What materials do you use that come from natural resources? Possible answers: Wood, paper, food (vegetables, fruits), metals; Accept all reasonable responses.

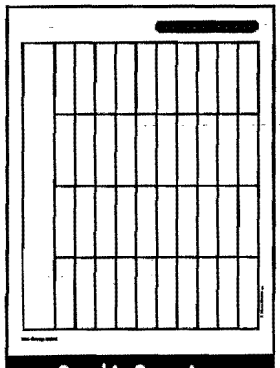
What would happen to a nonrenewable resource if we used it up? There would be no more of that resource because it cannot be replaced.

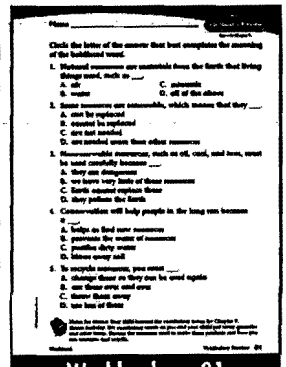
Discuss Essential Questions

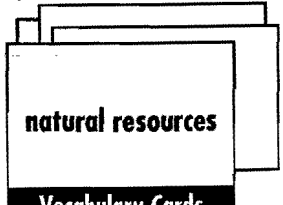
Ask students the preview question, ***How can people use natural resources responsibly?*** Save responses for later in the chapter.



Build Background Resources

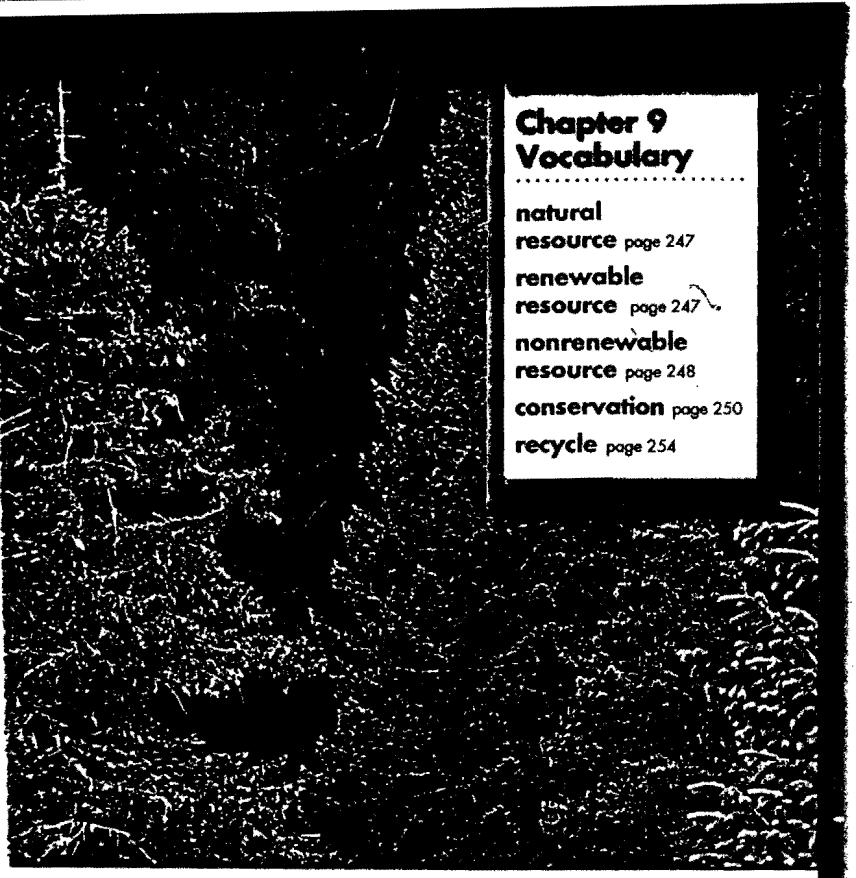

Graphic Organizer Transparency 8

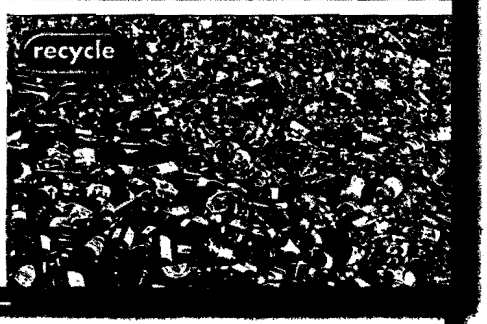

Workbook, p. 81



ELL Support

Access Content Before reading the chapter text, lead students on a picture/text walk.





ɜnce Background

cycling symbol that appears on recyclable products can help ts understand the meaning of the term *recycle*. The following ists recycling codes (the number found within the symbol), plastic ınd some common uses of each type.

cling	Type of Plastic	Uses
	PETE	Soft drink containers
	HDPE	Milk jugs, beverage bottles
	PVC	Auto parts, shampoo bottles, shower curtains, inflatable toys
	LDPE	Trash bags and other films
	Polypropylene	Housewares, auto parts, screw-on caps, margarine tubs
	Polystyrene	Hot food containers, packaging materials, plastic utensils

2 Introduce Vocabulary

Use the Vocabulary Cards (Graphic Organizer Transparency 7) and the List-Group-Label Chart (Graphic Organizer Transparency 8) provided on **www.sfsuccessnet.com**.

Kinds of Resources	Extent of Resources	Protection of resources	
natural	limited	conservation	
renewable	unlimited	recycle	
nonrenewable			

- Use the Vocabulary Cards, or have students make their own set using Graphic Organizer Transparency 7.
- Have students pronounce the vocabulary terms and tell what they know about each. Ask students to suggest terms they think are related to the vocabulary terms. Make cards for additional terms as needed.
- Divide the class into small teams. Ask each team to group related terms, list those terms in one column of Graphic Organizer Transparency 8, and label each category at the top of the column.
- Ask teams to share their charts with the class.
- Students may add words to their charts as they work through the chapter. As a summary exercise, ask students to propose new labels, add new terms to existing groups, or propose new groups of words.

3 Practice

Vocabulary Strategy: Examples

Say: ***You can better understand a word if you think of your own examples of its meaning. Listen for the term* renewable:**

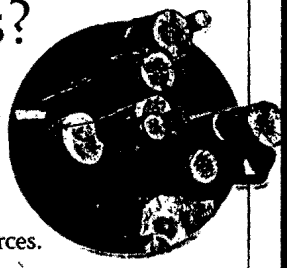
Resources that can be replaced in a fairly short time are called *renewable* resources. Trees are a renewable resource.

Say: ***What example of a renewable resource is given?*** Trees ***Perhaps you know tomatoes from a garden can also be used up, but replaced by growing more. Can you think of other examples?*** Possible answer: Crops that farmers grow

Lesson 1

What are resources?

Everything we use comes from in and above the Earth. Some of these materials can be replaced, but others cannot. A few resources are never used up.



These logs at a lumber or paper mill came from trees.

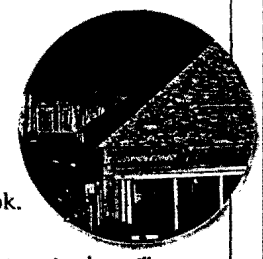
Resources That Can Be Replaced

The things we need come from natural resources. A **natural resource** is an important material from the Earth that living things need.

Some natural resources can be replaced. For example, trees and crops grow in soil on Earth's surface. Both need water and air. Water comes from rain, rivers, lakes, and groundwater. Air is everywhere above ground.

People cut down trees for their wood. They use wood to build new houses and turn wood chips into pulp. Pulp is made into paper. Paper products include boxes, newspapers, and this book.

People can plant new trees to replace those cut down. In time, the trees will grow big enough to be cut down again. A resource that can be replaced in a fairly short time is called a **renewable resource.** Trees are a renewable resource.



Lumber mills saw tree trunks into boards that are used to build new houses.

1. **Checkpoint** What makes some resources renewable?
2. **Writing in Science** **Expository** In your **science journal** make a table with two columns. Title one column *Wood*. Title the other *Paper*. Use the table to list things found in your home made from each. Then, write two paragraphs about how your family uses wood and paper products.

Guide Comprehension

Ask students the following scaffolded questions to assess understanding.

Scaffolded Questions

1. Name ***What are two natural resources?*** Possible answers: Water, air, trees, soil

2. Explain ***Why are trees renewable resources?*** More trees can be planted and will grow to replace those cut down.

3. Apply ***What characteristics make water a natural resource?*** Water is a natural material found on Earth that is needed by living things.

Extend Vocabulary

A **natural resource** is anything found in nature that is useful and has value to living things. The word *natural* may already be familiar to students. Something that is natural has not been made by humans. Ask students for an antonym of *natural* (*human-made*). As a class, list some resources people use that are natural and some that are human-made.

Diagnostic Check

If... students have trouble understanding how something can be a renewable resource,

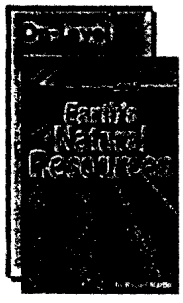
then... have them think about what happens when they renew a library book or renew a rented movie.

1. **Checkpoint** Renewable resources, such as trees, can be replaced within a fairly short period of time.
2. **Writing in Science** **Expository** Paragraphs will vary but might include mention of such paper products as newspapers, magazines, books, notebooks, toilet tissue, paper towels, paper plates and cups, napkins, and envelopes. Wood products mentioned might include tables, chairs, floors, desks, bookcases, window frames, cutting boards, and wooden spoons.

Leveled Readers

Begin to use the Chapter 9 Leveled Readers with appropriate reading groups at this time.

latural Resources as the same content s Chapter 9, but it written at a less fficult reading level.



Earth's Natural Resources has the same concepts as Chapter 9 and is written at grade level.

You Can Recycle! is above grade level and enriches the chapter with additional examples and extended ideas.

Science Objective

ıe student classifies resources as renewable nonrenewable.

Teach (continued)

tick SUMMARY

res are nonrenewable natural resources that ɔntain useful metals or other minerals.

ɹels, such as coal, oil, and natural gas, are ɔnrenewable resources that supply energy.

onrenewable resources cannot be replaced.

ınlight, air, and water are not used up.

e students read pages 248–249.

ind students to study the illustrations and tions to reinforce their understanding of the Have them list in their science journals the enewable resources they read about and add nples of their own. Draw students' attention to summary table on page 248.

Resources That Cannot Be Replaced

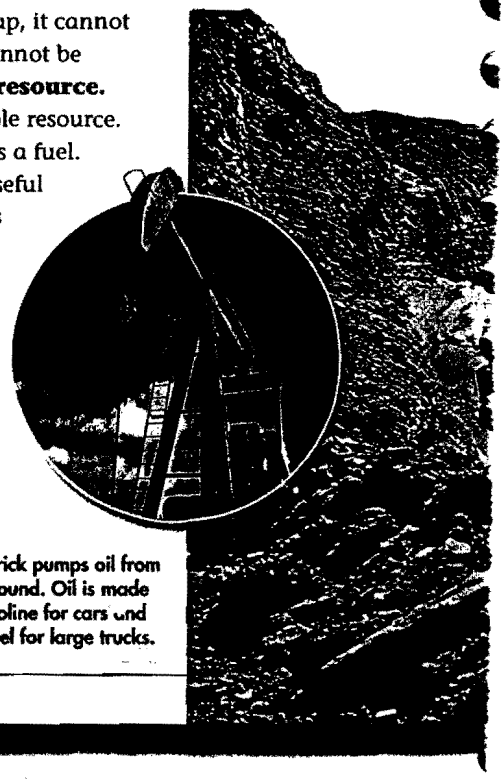
Many natural resources come from below the ground. Miners dig into the ground to get rocks called ores. Ores are important natural resources because they contain metals or other minerals that people use. Examples of useful metals are copper, iron, and aluminum. Hematite, for instance, is an ore that contains the metal iron.

Steel is made from iron. What will you use today that has steel in it? How about a bus or a fork? Lots of things are made of steel. But there is only so much iron ore in the ground. Once we use it up, it cannot be replaced. A resource that cannot be replaced is a **nonrenewable resource.**

Coal is another nonrenewable resource. Like oil and natural gas, coal is a fuel. When it is burned it releases useful energy. Energy from these fuels provides heat in buildings and power for cars, trucks, and planes. The energy from these fuels can be used only once. We can get more fuel by digging more of these materials from the ground. But supplies of these fuels are limited.

Using Resources

Resource	Uses
Oil	Gasoline, paint, plastic, shampoo
Coal	Electricity, heat, paint thinner, insecticides
Iron ore	Machines, bicycles, autos, buildings



This derrick pumps oil from underground. Oil is made into gasoline for cars and diesel fuel for large trucks.

Science Background

Impacts of Mining

Ores can be removed from the land by two general methods—surface mining and subsurface, or underground, mining. Each method impacts land and water resources in the mined area by affecting the quality of the water and the ability of the land to support plant life, wildlife, and other types of land use. The Surface Mining Control and Reclamation Act of 1977 and its subsequent amendments require that coal-mining companies restore the land and water resources to their original condition to protect public health and safety and that of wildlife in the area.

ELL Support

Language Detective: Prefixes

- As a prefix, *non-* can mean "not," "lack of," or "the opposite of."
- Have students add the prefix *non-* to *living*, *sense*, and *stop* and compose a meaning for each new word.

For scaffolded instruction about resources, use **Every Student Learns Teacher's Guide,** p. 39.

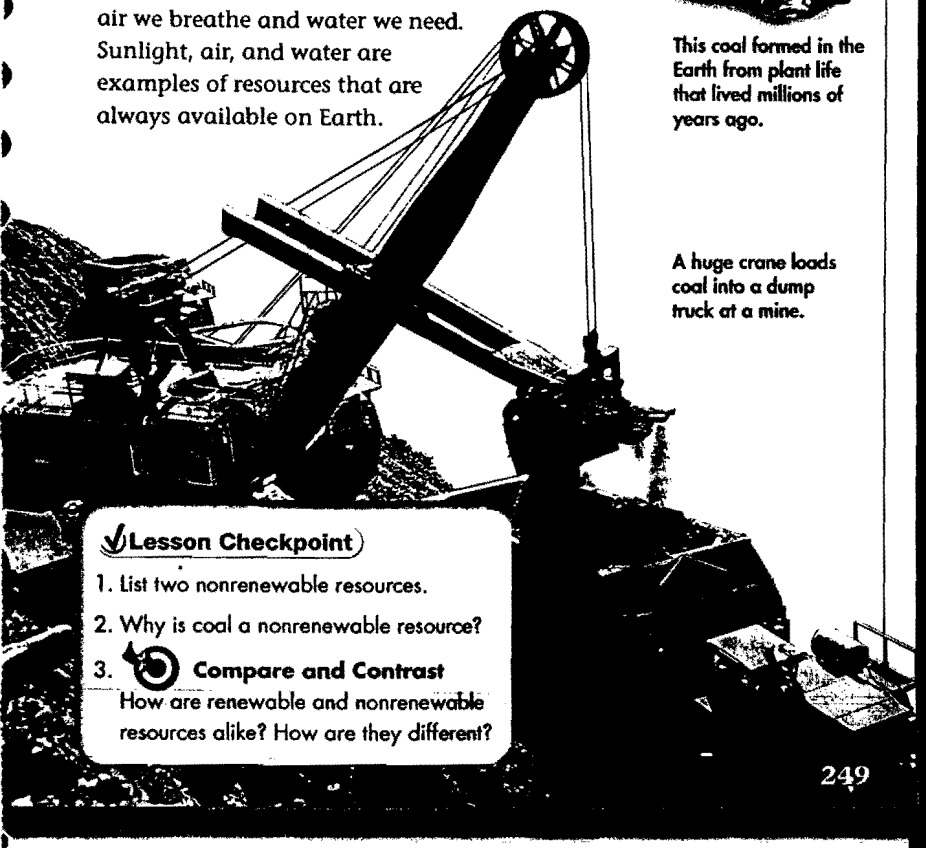
When we use up an ore, mineral, or fuel resource in one place, we must find new places to look. Mining and drilling can leave permanent marks, such as the open pit mine in the picture. Getting important natural resources from Earth can change its surface.

Hematite is an ore that contains iron.

An Endless Supply of Resources

Some natural resources are not used up. Plants, for instance, receive an ongoing supply of sunlight. The Earth can cleanse and return the air we breathe and water we need. Sunlight, air, and water are examples of resources that are always available on Earth.

This coal formed in the Earth from plant life that lived millions of years ago.



A huge crane loads coal into a dump truck at a mine.

Lesson Checkpoint

1. List two nonrenewable resources.
2. Why is coal a nonrenewable resource?
3. **Compare and Contrast** How are renewable and nonrenewable resources alike? How are they different?

Science Background

- Sunlight is a limitless energy resource. However, not all places on Earth get the same amount of sunlight. Some places, such as the southwestern United States, have enough sunny days to make solar energy a viable energy source, while other places, such as the northern Midwest, do not have enough sunny days to use solar energy in large amounts.
- Ethanol and hydrogen from solar energy are renewable fuels.
- Water can be considered a limitless resource but, like sunlight, is not equally distributed around the globe. Water is recaptured as it passes through the water cycle.
- Air constantly circulates, and precipitation washes it of particulates. Plants exchange oxygen for carbon dioxide and help filter air of impurities. Polluted air must be purified to be considered a limitless resource.

Guide Comprehension

Ask students the following scaffolded questions to assess understanding.

Scaffolded Questions

1. List ***What are three natural resources that are not used up?*** Sunlight, air, and water

2. Contrast ***How is iron ore different from trees?*** Iron ore is nonrenewable. It cannot be replaced. Trees are a renewable resource.

3. Draw Conclusions ***Why is it important to use ores and fuels wisely?*** Possible answer: They are nonrenewable resources and cannot be replaced. Wise use can make them last longer.

Extend Vocabulary

Break down the word **nonrenewable** to help students understand:

non + re + new + able =

not + again + new + able to be

Have students replace *new* with *use* and *place* to form synonyms for *nonrenewable (nonreusable, nonreplaceable)*. Ask them to use all three words in sentences.

3 Assess

Lesson Checkpoint

1. Two nonrenewable resources are metals such iron and fuels such as coal.
2. Coal is a fuel resource. When it is burned, it cannot be used again as a source of energy. New coal has to be taken from the ground. B there is only so much coal in the ground.
3. **Compare and Contrast** Both renewal and nonrenewable resources are natural resources that come from Earth. Both are thin that people need and use. But renewable resources can be replaced in a fairly short tir Nonrenewable resources cannot be replaced and once they are used up, they are gone forever.

Name: _____ **Vocabulary Preview**

Directions: Circle the letter of the answer that best completes the meaning of the boldfaced word.

1. **Natural resources** are materials from the Earth that living things need, such as ____.
   A. air
   B. water
   C. minerals
   D. all of the above

2. Some resources are **renewable**, which means that they ____.
   A. can be replaced
   B. cannot be replaced
   C. are not needed
   D. are needed more than other resources

3. **Nonrenewable resources**, such as oil, coal, and iron, must be used carefully because ____.
   A. the are dangerous
   B. we have very little of these resources
   C. Earth cannot replace them
   D. they pollute the Earth

4. **Conservation** will help people in the long run because it ____.
   A. helps us find new resources
   B. prevents the waste of resources
   C. purifies dirty water
   D. blows away soil

5. To **recycle** resources, you must _____.
   A. change them so they can be used again
   B. use them over and over
   C. throw them away
   D. use less of them

Lesson #2

Needs & Wants

Lesson #2
Needs & Wants

Materials:

- 'The Lorax," by Dr. Suess, one per class
- overhead of needs and wants, one per class [attached]
- Needs & Wants game, one set of cards per pair of students [one set attached]
- Needs & Wants worksheet, one per student [attached]
- chalkboard
- chalk

Objective/Academic Standard:

Science Standard 4 ~ The Living Environment → Students learn about an increasing variety of organisms. They use appropriate tools and identify similarities and differences among them. Students explore how organisms satisfy their needs in typical environments.

Diversity of Life 3.4.2 → Explain that features used for grouping depend on the purpose of the grouping.

The student will be able to group items based on specific features and be able to explain their groupings to the class. The student will also be able to answer several questions on "The Lorax" and be able to expand on those questions with at least 80% accuracy.

Motivation:

I will begin this lesson by reading "The Lorax," by Dr. Suess. This picture book contains fun rhymes and made-up words, as well as colorful and imaginative pictures, which will peak the students' interest. I will tell the students to pay close attention to the environment on each page of the book.

Goal for Learner:

The goal for the learner for this lesson is that the student will be able to play the Needs & Wants game, and be able to explain why they created their specific groups. Another goal is for the students to be able to answer several higher-level questions about "The Lorax."

Content and Procedures:

Teacher Content: The Lorax was a character who spoke on behalf of the trees and wildlife when environment pollution (caused by the Once-ler) was destroying them. The Needs & Wants game will have the students grouping items together however they want, but they must be able to justify why they created the groups that they created.

Procedure:

- After I have finished reading "The Lorax" aloud, we will discuss the Lorax's final comment, which was "UNLESS." I will ask the students what they thought it meant, and what they would do to help the situation that the Once-ler caused. I will also ask the following questions, and we will discuss:
    - What effect did the Once-ler's business have on the Lorax?
    - Why was the Super Axe Hacker invented?
    - Why did the Once-ler ignore the Lorax's warnings?
    - What happened to the Lorax?
- I will put up the overhead of needs and wants, and the students will give me examples of what to put in each category. We will discuss each answer as well. The categories are "What do you really need in order to live?" (oxygen, water, food, etc), "What would a plant/animal need to live?" (food, water, shelter, etc), and "What are things that are convenient to have, but we don't *really* need?" (car, toys, video games, etc).
- We will then play the Needs & Wants game. I will have the students partner up, and I will give each set of partners an envelope full of the game pieces. I will direct them to sort their cards into piles that are alike in some way. I will then ask them to explain which "rule" they used for sorting the cards. We can list the rules on the chalkboard in front of the class, and see how many different "rules" the class can create. I will then have all of the groups put their cards back into the envelopes, and group the pictures according to "need" and "want." We will have a short discussion following that activity, talking about which item went in which category and why.

Accommodations for all special education students:

- Give directions one at a time.
- Check for understanding.
- Repetition of directions.
- Restate directions for clarification.
- Extended time for assignments.

Practice/Application:

I will pass out the Needs & Wants worksheet to each student. If there is time, I will give the students an opportunity to start their homework during class. This worksheet is to be turned in the following day.

Evaluation of Student Learning:

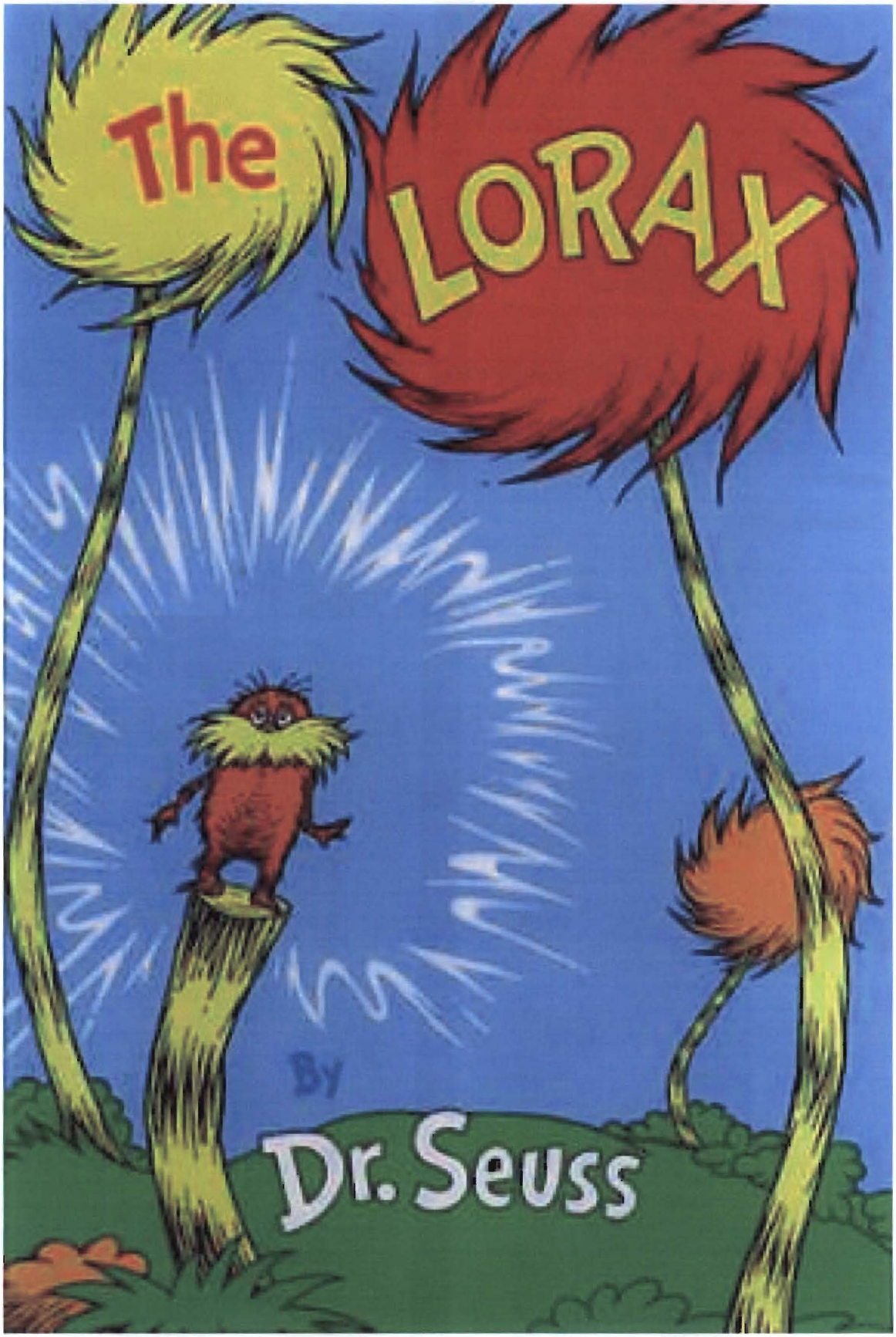
I will grade and record the grades of the students' work on the Needs and Wants worksheet. This page will demonstrate whether the student can answer several questions on "The Lorax" and be able to expand on those questions with at least 80% accuracy (5.5 out of 7).

Closure:

I will ask the students, "Who can give me an example of a want and a need? Which is more important and why? Do you think Dr. Suess' book can relate to the environment today? Why or why not?" We will discuss all of these questions and the students' probable varying answers.

Evaluation of Lesson: Personal Reflection

The students really seemed to enjoy the Dr. Suess book. This was the first time this year they had been read to from a picture book, and they were all eager to see the pictures. It was refreshing for me that they really seemed to pick up on the idea that the problem with the Once-ler and the Lorax *does* apply to the world today. This book really gave them a great (and fun) introduction to pollution and how damaging it can be on the environment. I think one thing I could have improved on was to give the students less time with the Needs & Wants game. It ate up a lot of lesson time, which I feel could have been applied to discussion time. Unfortunately, we only have thirty-five minutes of science four days a week, so we have to squeeze all the activities in that short amount of time. It is encouraging for me to see the students all wanting to contribute to the discussions, tell personal stories, and ask higher-learning questions. The worksheet proved to be slightly difficult for them, however. Spelling and writing is not the forte of very many of my students, so it was hard for me to grade the worksheet when one student was giving one-word answers, and a different student was writing sentences at length.


The
LORAX
By
Dr. Seuss

What do you really need in order to live?

Oxygen
food
water
friendship
a home
sun

What would a plant/animal need to live?

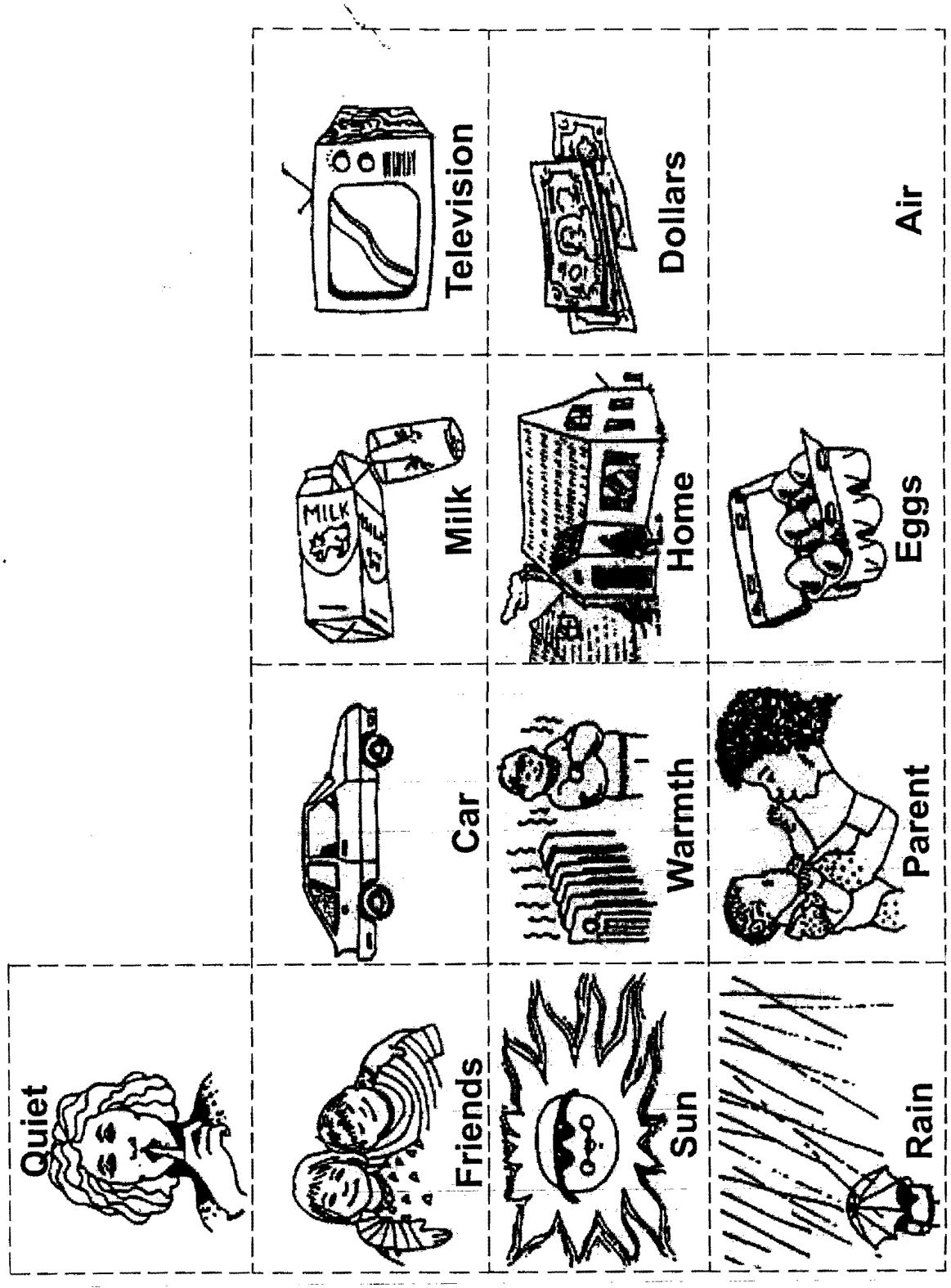
food
water
shelter
sunlight
oxygen

What are some things that are convenient to have, but we don't *really* need?

car
cool clothes
candy
electricity
swimming pools
video games
fast food
airplanes
jewelry
toys
pets
vacations

Worksheet: Needs and Wants Game Pieces

Source: California Department of Health Services Toxic Substances Control Program, *The No Waste Anthology* (1991)



Worksheet: Needs and Wants Game Pieces

Source: California Department of Health Services Toxic Substances Control Program, *The No Waste Anthology* (1991)

Worksheet: Needs and Wants

Student Name: _____

1. Why did the Once-ler cut down the Truffula trees? _____

_____

_____

2. Why do the Brown Bar-ba-loots have to leave? _____

_____

_____

3. What kinds of problems does the thneed factory cause for the environment? Name at least three.

_____

_____

_____

4. What happens to the Once-ler when there are no more Truffula, trees? _____

_____

_____

5. What happens to the Lorax? _____

_____

_____

6. Is bigger always better? Give an example to back up your opinion. _____

_____

_____

7. A "Thneed" is defined as a fine thing that everyone thinks they need. What are some examples of thneeds - things that we think we need? _____

_____

_____

Source: Association of Vermont Recyclers: *Teacher's Resource Guide for Solid Waste and Recycling Education* (1999)

Worksheet: Needs and Wants

Student Name: Mikayla Hurst

1. Why did the Once-ler cut down the Truffula trees? So he can get more money and make more th-needs!

2. Why do the Brown Bar-ba-loots have to leave? because he cut down all the truffula trees and the food was in the trees so they had no more food

3. What kinds of problems does the thneed factory cause for the environment? Name at least three.
1. They put the pond and because they ate all the fish test. 2- All the swans left because he stood up the air 3. All the Bar-ba-loots left Because he cut down the trees which had fruit in them.

4. What happens to the Once-ler when there are no more Truffula trees? All his family leves and there are no more Truffula trees so he can't make eney more thneeds. So his fatrory got smaller.

5. What happens to the Lorax? He disappers into the sky. because there were no more Truffula trees to watch over.

6. Is bigger always better? Give an example to back up your opinion. No because in The story "The Lorax" he cuts down the trees and because of it he had no more thneeds to make. So his factory got smaller.

7. A "Thneed" is defined as a fine thing that everyone thinks they need. What are some examples of thneeds - things that we think we need? I need a Shrit, Scerf and pants, shoes, and nice hightness.

Source: Association of Vermont Recyclers: *Teacher's Resource Guide for Solid Waste and Recycling Education* (1999)

(5)

Worksheet: Needs and Wants

29 to F

Student Name: Andrew Littau

1. Why did the Once-ler cut down the Truffula trees? to make more thneed

2. Why do the Brown Bar-ba-loots have to leave? he don't have no food.

3. What kinds of problems does the thneed factory cause for the environment? Name at least three. tree, pot's, pipes,

4. What happens to the Once-ler when there are no more Truffula, trees? he go back home and stay ther

5. What happens to the Lorax? he made it all happen

6. Is bigger always better? Give an example to back up your opinion. no the bigger you are the old you get the sorry you are

7. A "Thneed" is defined as a fine thing that everyone thinks they need. What are some examples of thneeds - things that we think we need? they can't do me.

Source: Association of Vermont Recyclers: *Teacher's Resource Guide for Solid Waste and Recycling Education* (1999)

Lesson #3

How Can We Protect Our Resources?

Lesson #3

How Can We Protect Our Resources?

Materials:

- Scott Foresman Science textbook, Grade 3, pages 250-253, one per student [attached]
- white wide-lined paper, one per student [attached]
- Rubric for Science Vocabulary Sentences, one per student [attached]

Objective/Academic Standard:

Science Standard 1 ~ The Nature of Science and Technology → Students, working collaboratively, carry out investigations. They question, observe, and make accurate measurements. Students increase their use of tools, record data in journals, and communicate results through chart, graph, written, and verbal form.

Technology and Science 3.1.8 → Describe how discarded products contribute to the problem of waste disposal and that recycling can help solve this problem.

The student will be able to write sentences using the chapter's vocabulary words with at least 88% accuracy. The student will also be able to give examples of how to use resources wisely, and participate in a discussion about landfills.

Motivation:

I will begin today's lesson by reviewing what natural resources are, as well as renewable and nonrenewable resources (taught two lessons ago). I will lead the students into having a short discussion about the nonrenewable resources that we depend on (such as coal and oil), and what can be done now that the Earth is running out of these resources. This will lead directly into our reading for today, which is about conservation and landfills.

Goal for Learner:

The goal for the learner for this lesson is that the student will be able to discuss conservation and ways to use our resources wisely. Another goal is for the student to understand the concept of a landfill and to participate in a discussion about the problems with landfills and suggestions for solutions to those problems.

Content and Procedures:

Teacher Content: Conservation is the wise use of natural resources so that people do not waste them or use them up. A wetland cleans water well enough to go into a river, but it must go through a water-treatment plant before being fit for human use. A landfill is where trash goes when it is hauled away. Landfills continue to grow, and we are running out of space for them. Some garbage is burned, but it takes special smoke cleaners to purify the air, and these are expensive.

Procedure:

- I will have the students open their science books to page 250, which is the beginning of Lesson Two of Chapter Nine. I will have the students read the title of this lesson, and then ask them what they think we'll be learning about for this lesson (how to protect our resources).
- I will have the students read pages 250-253 silently, while I read aloud. This is in the interest in time, and also to cater to the needs of visual and auditory learners. We will periodically stop during the reading for spontaneous discussions on what we have read, such as how wetlands work, soil and erosion, how to conserve water, why landfills are filling up, alternatives to landfills, etc.
- We will then look at the chart What is in a Year's Worth of My Trash? and talk about each item and the weight conversion (from kilograms to pounds, so the students can understand and relate). I will then lead a discussion with them about how much trash all the people in our classroom create, and then times all the classrooms in the school, and then times all the schools in the Muncie Community School Corporation (I can do the math problems on the overhead, so the students can be exposed to multiplication). The point is to get the students to realize how much trash people generate, and how it's happening all over the world with more than six billion people.

Accommodations for all special education students:

- Give directions one at a time.
- Check for understanding.
- Repetition of directions.
- Restate directions for clarification.
- Extended time for assignments.

Practice/Application:

I will tell the students that they will write sentences using four of their vocabulary words from the previous two chapters, being *renewable resource, nonrenewable resource, conservation,* and *recycling.* This will show if the students understand what the vocabulary words mean, instead of just copying the definitions out of a dictionary. If there is time, I will ask the students to take out a piece of white notebook paper and give them an opportunity to start their homework during class. This assignment is to be turned in the following day.

Evaluation of Student Learning:

I will grade and record the grades of the students' work on the vocabulary sentences by using the attached rubric. This page will demonstrate whether the student can write sentences using the chapter's vocabulary words with at least 88% accuracy (or 7 out of 8 possible points).

Closure:

I will ask the students, "Who can tell me what a landfill is? What are the problems that we're having with landfills? What can we do to conserve water?" I will review everyone needs to help save the environment by doing a little bit themselves, and that each person *can* make an impact. I will close the lesson by telling the students that they will each be making their own model of a landfill tomorrow in class by using a milk jug, paper, dirt, garbage, plastic, and animal figurines.

Evaluation of Lesson: Personal Reflection

I tired very hard today to make today's lesson not seem boring. Not that it was, particularly, but *I* know what exciting projects we have coming up for this unit, and reading out of the students' third grade science book just doesn't seem as exciting or hands-on as making recycled paper or picking up litter outside. The students really latched on to the idea of landfills, however, and were extremely interested in the amount of trash that people produce each year. As the numbers of pounds of trash got higher, the students got more impressed. But at the same time, I could also tell that they were starting to realize what a problem overflowing landfills have become. Despite the semi-monotony of reading from the book, the students managed to stay interested and their interest levels *definitely* peaked when I informed them that we would be making model landfills tomorrow in class. This class really seems to enjoy hands-on activities, so I am excited that they are thrilled and anticipating tomorrow's lesson!

Lesson 2

How can we protect our resources?

Science Objective

The student knows that reusing, recycling, and reducing the use of natural resources improve and protect the quality of life.

1 Introduce

Quick ACTIVITY TRANSPARENCY 31

Give each group 2 clear plastic cups filled with clean water and some dirt.

Ask them which they would rather have coming from their faucet.

Discuss ways that the dirty water can be made clean.

ccess Prior Knowledge

Vrite the word *conservation* on the board. Ask udents to create Directed Reading charts showing hat they know and think they know about onservation and what they want to learn about . After the lesson, have them complete a fourth olumn—what they have learned.

et Purpose

ll students that they are going to learn how aluable resources can be conserved, or protected. elp students set a **purpose for reading,** such s looking for ways water can be conserved.

2 Teach

Quick SUMMARY

Conservation is the wise use of natural resources.

People can take steps to conserve natural resources such as water and soil.

ave students read pages 250–251.

ssign Quick Study pp. 62–63 to students who eed help with lesson content.

How can we protect our resources?

Dirty water is piped into a wetland in Florida. It will become clean enough to be piped back into a river.

Water from homes is filtered through sand in ponds like these. Farmers use the recycled water for their orange trees.

We must protect natural resources by not using them up or damaging them.

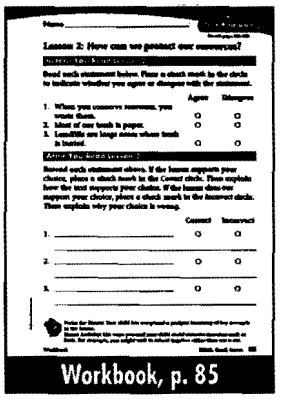
Using Resources Responsibly

When people walk or ride a bicycle or a bus instead of riding in a car, they are saving fuel. When they choose products that have less packaging, they are saving paper and plastic and making less garbage. Saving in these ways is called conservation. **Conservation** is the wise use of natural resources so that people do not waste them or use them up.

Clean water is an important resource. We can conserve water by using less of it. You can, for instance, turn off the water while brushing your teeth and take shorter showers.

One way that communities conserve water is to clean the water that is used. A wetland, for instance, cleans dirty water. First, the dirty water is piped into wetlands. Soil filters out harmful particles. Then, plants and tiny living things break down the particles. Afterward, the water is clean enough to flow back into a river and be used again.

Lesson 2 Resource



Workbook, p. 85

Science Misconception

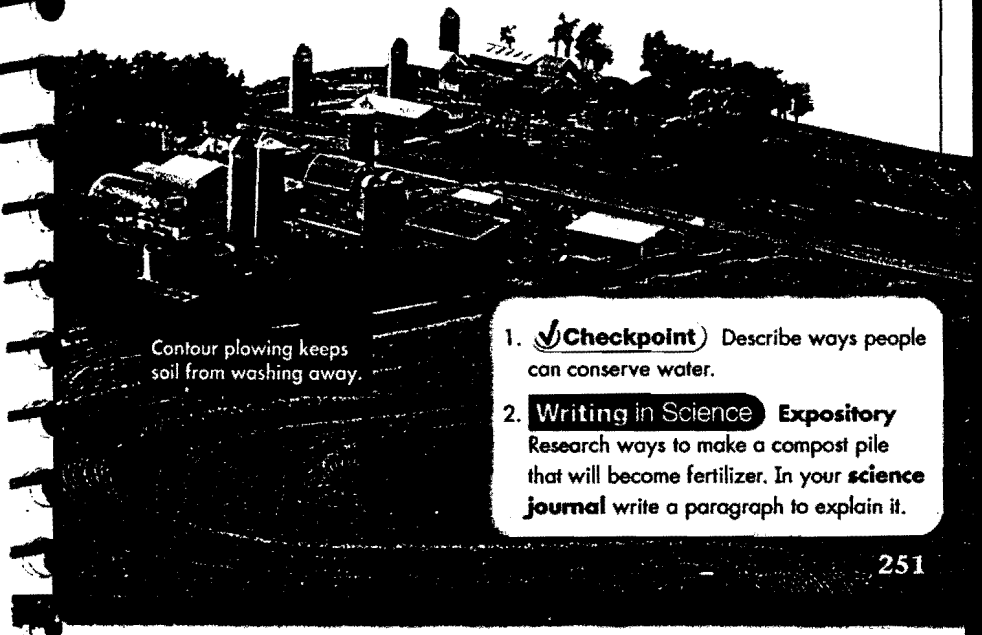
Students may be confused about how wetlands clean water. The water is clean enough to be returned to a river, but it must go through a water-treatment plant (see Chapter 5) before being fit for human use.

Soil is another resource that must be used wisely. Soil needs protection from water and wind erosion. Some farmers help conserve soil when they plant their crops around hills instead of up and down the hills. The curved rows of plants act like dams to hold back rainwater. Soil soaks up water instead of being washed away. Farmers also plant trees alongside fields to keep soil from blowing away.

As people in cities need more room, they often build new houses on nearby farmland. Buildings and roads cover the soil. The soil is then lost to farming. What can we do to protect land that has good soil for growing crops?

We can start by protecting soil in our own backyard. We can put yard clippings and leaves where they decay instead of sending them to the landfill. This natural process turns them into compost. You can add compost to garden soil for fertilizer.

We could allow these leaves to decay into compost. Then they would add nutrients to soil.



Contour plowing keeps soil from washing away.

1. **Checkpoint** Describe ways people can conserve water.
2. **Writing in Science** **Expository** Research ways to make a compost pile that will become fertilizer. In your **science journal** write a paragraph to explain it.

ELL Support

Show students a photograph of straight-row plowing, and contrast it with the photograph of contour plowing shown on page 251. Have them describe the differences to you.

For scaffolded instruction about protecting resources, use **Every Student Learns Teacher's Guide,** p. 40.

Guide Comprehension

Ask students the following scaffolded ques to assess understanding.

Scaffolded Questions

1. Give Examples *What are two w that people can conserve fuel?* Possi answers: Walk or ride bicycles; turn off lig when not being used

2. Explain *How can a wetland hel conserve water?* Wetland soil filters ha particles out of water, and plants and tiny things break down the particles. Then the can flow back into a river and be used ag

3. Support *What reasons would yo give to support this statement: Farm should use contour planting and plc trees.* These methods keep soil from being washed away by rain or blown away by

Extend Vocabulary

The root of **conservation** is *conserve*. To cor means to keep or preserve; to keep from being damaged, lost, or wasted. In art, a conservato person who restores or repairs a piece of art. A students how the job of someone who restores like the work done by a wetland.

Diagnostic Check

If... students do not understand how plan help keep soil in place,

then... show students a small sample o turf. Pull the sample apart gently so that stu can see soil trapped in the root system. A sample of sod will also show how grass roo hold soil.

1. **Checkpoint** People can conserve w by using less water (such as turning off wa when brushing teeth) and by cleaning wate
2. **Writing in Science** **Expository** Students' paragraphs might include the following ideas: Layers of soil, yard wastes manure, and vegetable food scraps are put into a fenced pile or barrel. The stacked lay are kept moist. Every few weeks, the pile o barrel is mixed. Natural decay breaks dow material. New layering can be added on to Fully decomposed matter can be removed fr the bottom. You can add this fertilizer to soi that plants grow better.

Science Objective

- The student knows that reusing, recycling, and reducing the use of natural resources improve and protect the quality of life.

2 Teach (continued)

Quick SUMMARY

- When products are no longer needed, they are thrown away and often brought to landfills.
- Many landfills are closing because they are completely filled.
- One way to lessen the need for landfill space is to lessen the amount of trash that is made.

Have students read pages 252–253.

Ask students to look for the answers to three questions:

- What happens to trash?
- Why are landfills a problem?
- What can be done about the problem?

Discuss the table on page 252. Ask students to relate it to their own lives.

Using Up Land Space for Trash

Everything we use is made from natural resources. For example, plastic milk jugs are made from oil. Food cans are made from metals such as steel and tin. When we no longer need these products, we throw them away. They become trash. The trouble with our trash is that it never really goes away. A truck often hauls trash to a landfill. A landfill is a large area in which trash is buried. Trash rests on top of a liner so that pollution does not leak into groundwater. Once in place, we no longer have to see, smell, or worry about our garbage making us sick. But it still exists and the landfills continue to grow.

We put more than two hundred million tons of trash each year into landfills like this one.

What is in a Year's Worth of My Trash?

Materials	Mass (in kilograms)
Paper	250
Plastic	80
Metal (steel cans)	40
Metal (aluminum cans)	10
Glass	40
Food scraps	80

Math Link

Analyzing Data

- Referring to the chart on this page, ask students: ***How many kilograms of trash does one person throw away each year?*** 500
- Referring to the data on landfills in the paragraph at the top of page 253, ask students: ***How many fewer landfills are there now than there were twenty years ago?*** About 6,000

My Science Journal

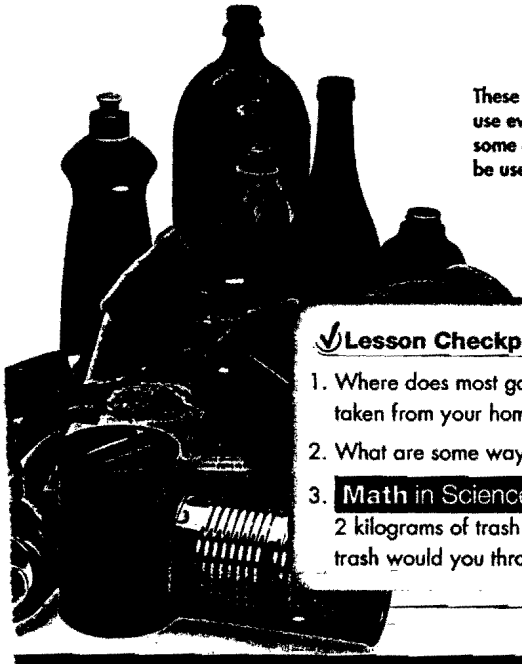
Collecting Data on Waste

Have students make four columns on a page in their science journal—one column each for metal, glass, plastic, and paper. Ask students to track the number of pieces of each type of trash they throw out for one week.

Landfills are filling up and closing down. The number of landfills has fallen from 8,000 in 1988 to less than 2,000 today. Our need for land in which to bury our trash continues to grow. Most people, however, would rather see land used for other purposes.

One way we are reducing the need for landfill space is by burning garbage in special furnaces. Burning garbage also gives off energy that can heat buildings and generate electricity. However, the smoke from the burning must be cleaned. If the smoke is not cleaned, it can harm the air we breathe. Special smoke cleaners are expensive.

Another way we are lessening the need for landfill space is by reducing the amount of trash we make. If we were not doing this, we would have needed 100 new landfill areas. What are ways we are reducing the amount of trash we make?



These are objects we use every day. Can some of these materials be used again?

Lesson Checkpoint

1. Where does most garbage go after it is taken from your home?
2. What are some ways to save landfill space?
3. Math in Science If you throw away 2 kilograms of trash each day, how much trash would you throw away in a year?

ial Studies Link

to Reduce Waste

me states, people can turn in an empty beverage container get a deposit back. In states with a five-cent deposit, about ercent of containers are returned. In states with a ten-cent sit, about 90 percent of containers are returned.

ss your state's policy on returning beverage containers. If you ı a state with a deposit law, invite students to write letters to ditor of their local newspaper encouraging everyone to return s and cans. If your state does not have such a law, invite its to write letters suggesting that one be passed, citing reasons this. Model a persuasive letter for students.

Guide Comprehension

Ask students the following scaffolded questions to assess understanding.

Scaffolded Questions

1. Understand *What happens in a landfill?* Garbage is dumped and buried. Then some of the garbage decomposes.

2. Explain *Why is burning probably not the best way to reduce the amount of trash that goes into a landfill?* Burning produces harmful smoke, and cleaning the air of smoke is expensive.

3. Solve Problems *What are ways to reduce the amount of trash we make?* Answers may vary, but students may come up with the ideas of reusing things instead of throwing them away and recycling. These topics are discussed in detail in Lesson 3.

Extend Vocabulary

See how many synonyms students can think of for the word *trash (garbage, waste, rubbish, refuse).*

3 Assess

Lesson Checkpoint

1. Most garbage goes to a landfill.
2. Burn garbage in special furnaces and reduce the amount of trash produced
3. Math in Science 2 kilograms per day × 365 days = 730 kilograms

   Remind students that there are 365 days in a year. If students cannot multiply with three-digit numbers, help them approach the problem in a different way. Ask: ***If you throw away 1 kilogram of trash each day, how much would you throw away in 365 days?*** (365 kg) ***If you throw away a second kilogram each day, how much would you throw away in 365 days, or a year?*** (365 + 365 = 730 kg)

Rubric for Science
Vocabulary Sentences

	0 did not attempt to use the word	**1** attempt was made, but not 100% accurate	**2** vocabulary word was used correctly in the sentence
renewable resource			
nonrenewable resource			
conservation			
recycling			

Student Name: _____ Total: /8

Rubric for Science
Vocabulary Sentences

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nonrenewable resource			
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recycling			

Student Name: _____ Total: /8

Rubric for Science
Vocabulary Sentences

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renewable resource			
nonrenewable resource			
conservation			
recycling			

Student Name: _____ Total: /8

Science Zach

1. Paper is renewable resource.
2. Rocks are a nonrenewable resource.
3. Conservation is using natural resources wisley.
4. We recycle plastic and paper.

Rubric for Science
Vocabulary Sentences

	0 did not attempt to use the word	1 attempt was made, but not 100% accurate	2 vocabulary word was used correctly in the sentence
renewable resource			✓
nonrenewable resource		✓	
conservation			✓
recycling			✓

Student Name: Zach M. Total: 7/8 88% Br

Lesson #4

Looking At A Landfill

Lesson #4

Looking At A Landfill

Materials:

- a prepared one-gallon milk jug (meaning the top is cut off), one per student
- garden soil, three bags per class
- grass
- leaves
- sticks
- small plastic animals, two per student
- plastic bags for lining, one per student
- blue construction paper, one sheet per student
- pieces of daily garbage
- Making A Landfill rubric, one per student [attached]
- overhead of What Happens to Garbage?, one per class [attached]
- When Will These Things Decompose, one per student [attached]

Objective/Academic Standard:

Science Standard 3 ~ The Common Themes → Students work with an increasing variety of systems and being to modify parts in systems and models and notice the changes that result. They question why change occurs.

Models and Scale 3.6.3 → Explain how a model of something is different from the real thing but can be used to learn something about the real thing.

The student will be able to construct a model of a landfill, and explain each part of the landfill. The student will also be able to define "decompose."

Motivation:

I will begin today's lesson by reviewing what we talked about yesterday, as far as landfills are concerned. We will have a short discussion on the problems with landfills, just to refresh everyone's memories. I will then proceed with the lesson by reminding my students that everyone is going to make a model landfill today, which is going to require that they pay very close attention to the directions.

Goal for Learner:

The goal for the learner for this lesson is that the student will be construct a model landfill, and understand that it is a replica of the real thing, which is much larger in size. The student will understand how the trash is buried, as well as discover how long it takes for some garbage to decompose.

Content and Procedures:

Teacher Content: Landfills are areas of land where garbage is buried. The garbage is covered with soil, which helps keep disease and smell away. The landfills are also lined with plastic, in order to prevent the garbage from getting to the groundwater. Almost all garbage is eventually disposed of in a landfill. Some (not all) are "modern" landfills, meaning they were built after 1991 and are lined with thick plastic and clay layers. They have leak monitoring systems in order to protect the groundwater. Older, unlined landfills pollute and we have to pay to clean them up until they no longer exist. Federal law is that closed landfills must be monitored for thirty years. Waste does not "go away" or decompose when it is placed in a landfill in comparison to a natural cycle. Landfills take up space and are located in areas that are, or were, habitats for people and wildlife.

Procedure:

- I will share the above information with my students. We will have a short discussion on how garbage does not decompose (or break apart until it is something the soil can use again) nearly as quickly in a landfill as it would if it were lying out in an open field, because it is covered by soil. However, if the soil does not cover the garbage, it begins to smell and it can contain disease. We will talk about the newer landfills that are lined by thick plastic and clay, and why this is safer for the environment.

- To make the landfill in a jug:
    - Hand out one plastic milk gallon jug to each student, with the top already cut off [see attached chart]. Each student also gets blue construction paper, 6 cups of soil, a piece of a plastic bag (big enough to act as a liner for a landfill), Have the students cut out a circle of the blue paper that is large enough to fit in the bottom of the empty milk jug. Then have the students pour their soil over that paper and flatten it out.
        - ❖ Ask the students, "What does the blue paper on the bottom represent?" (the groundwater). Water is under the ground, and people pump this water through wells and use it to drink and farmers use it to water their crops. Garbage should not touch or leak on to the blue paper.
    - Have the students dig a hole for a landfill in the soil of the gallon jug. That soil will be used later to cover up the disposed trash.
    - Hand each student a piece of the plastic bag, which will be their landfill liner. Have them place it in the hole, making sure that the garbage won't be able to leak into the rest of the soil.
    - After the students have their plastic liner in place, have them place six or seven pieces of garbage (1/2 to 1 inch in size) in their landfill hole. They can find garbage in the room, like a piece of a crayon, tissue, a leaf, a piece of paper, grass, etc.
    - Have the students pack down the garbage, as compactors do at a real landfill. Cover the garbage layer with soil. This simulates how the garbage at a landfill is covered daily with soil to eliminate smell and to keep animals, such as rats, out of the landfill.
    - Have the students put their plastic animals on top of the landfill, to show that people and animals used to and still do live on or near landfills.

- After the students have finished their model landfills, I will ask them questions such as "What can be done with our garbage now that our landfill is full? Will digging a new landfill cause any problems? (yes, it impacts the land, plants, and animal life in the area) What could we do to keep the landfill from filling up so quickly? (reuse, reduce, recycle)"

Accommodations for all special education students:

- Give directions one at a time.
- Check for understanding.
- Repetition of directions.
- Restate directions for clarification.
- Extended time for assignments.

Practice/Application:

The application for today's lesson on landfills will be each student's model landfill. I will fill out the attached rubric according to observation while the students are making their landfills.

Evaluation of Student Learning:

I will grade and record the grades of the students' work on the vocabulary sentences by using the attached rubric. This page will demonstrate whether the student can write sentences using the chapter's vocabulary words with at least 88% accuracy (or 7 out of 8 possible points).

Closure:

I will then pass out the "When Will These Things Decompose?" handout to each student. We will look at the number of years that it takes certain garbage to decompose. I will also tell the students that this chart only applies to garbage that is exposed to open air and sunlight, not garbage that is buried in a landfill. I will lead this fact into a short discussion about how it takes things much longer to decompose when they are covered up by dirt, like most garbage is while sitting in a landfill.

Evaluation of Lesson: Personal Reflection

Things were a lot less messy than I thought they would be today. My students are not used to doing projects of any kind, and they are especially not used to being allowed to get dirty to complete their projects. Their attention levels were extremely high throughout the lesson, which made it more enjoyable. If I could change anything about this lesson, it would probably be the amount of time we had to complete it in. We are restricted to a 30-minute period of time for science, so I really had to rush things and keep them moving throughout the lesson. I suppose a benefit to this is that there was never any time for a student to get bored or sidetracked, but situations like that worry me because some of the special education students may struggle to keep up, and it is almost impossible to slow the entire class down. I think the best part of my lesson was the very end, when we were verbally reviewing things as a class. I told my students I was giving them a mini-oral quiz, and they performed wonderfully. Each student I called on was able to answer my question, whether it be asking what a certain material in the model landfill stood for in real life, or why certain things were used, how long it took certain materials to decompose, etc. It was very encouraging, and I hope the success I feel from this lesson will be reflected in their post-tests.

Making A Landfill

Rubric

	0 no attempt was made	1 attempt was made, but not 100% clear and/or correct	2 accurate/appropriate answer/action was given/shown
was able to follow verbal directions			
was able to follow written multi-step instructions			
landfill contained all necessary parts			
was able to provide a verbal explanation for the parts of a landfill			
was able to provide a verbal explanation as to how this project was a model of a real landfill			

Student Name: _____ Total: /10

Steps to Making Your Landfill

1. Get a milk jug from Miss Meyer.

2. Use a section of newspaper to cover your desk or floor area, in order to prevent messes.

3. Take a blue piece of paper and cut out a piece that is small enough to cover the entire bottom inside of the jug. Place the paper inside your jug.

4. Ask Miss Meyer for garden soil. Take your jug with the soil inside back to your desk and spread it smoothly across.

5. Dig a small hole with your fingers. This will be your landfill, so make it big enough to store "garbage" in it, but not so big that it takes up your entire jug. Also be sure not to dig it all the way to the blue paper, as this is your groundwater, and a landfill never wants to hit groundwater.

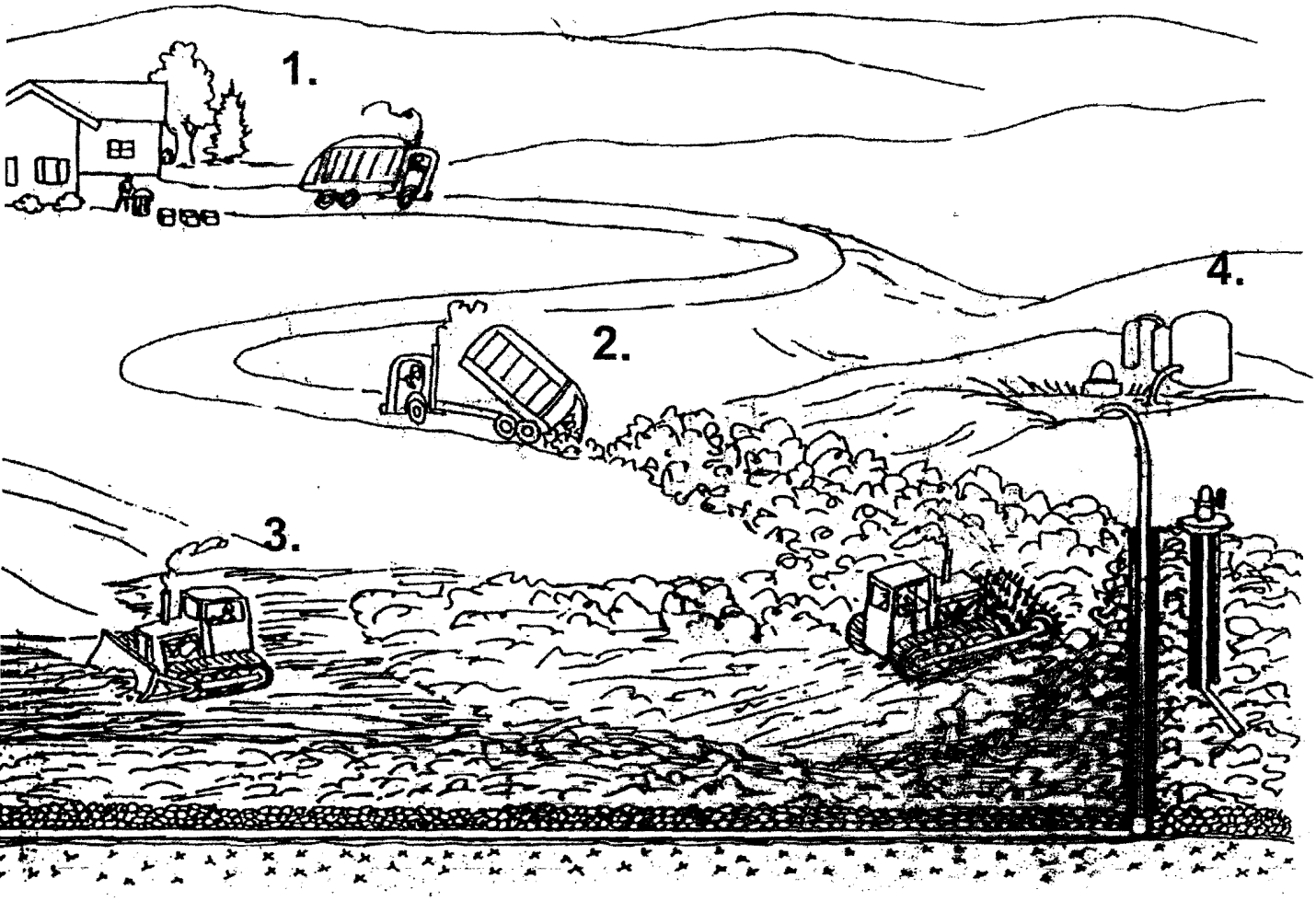
6. Go to the front of the classroom and take a small piece of plastic bag. Take it back to your desk and place it in your landfill hole, so it lines the hole.

7. Walk around the classroom and find garbage to put in your landfill. You can use paper, tissue, pencil shavings, or anything else (small) you find on the ground. Take it back to your jug, fill your landfill hole with your garbage, and make sure it's all staying in your lining (or plastic bag).

8. Compact your garbage down in the hole. Cover your garbage up with the extra soil from when you dug your hole. Make sure none of it can be seen from the top anymore.

9. Go to the front of the room and pick out two plastic animals to put on the top of your soil.

10. Take your model landfill back to your desk and sit quietly until everyone has finished.



1. Garbage is taken from your house.
2. Garbage is delivered to the landfill.
3. Garbage is compacted and buried in a landfill.
4. Equipment checks the water to make sure it is clean and safe.

lifornia Integrated Waste Management Board: *Closing the Loop: Exploring Integrated Waste Management*
rce Conservation K-6 (2000)

Overhead: When Will These Things Decompose?

Eternity

Styrofoam "clam shell"
unknown, forever???

Glass bottle
unknown, forever ???

1,000,000 years

Plastic jug
1 million years

1,000 years

Disposable diaper
500 - 600+ years

500 years

Aluminum can
200 - 500 years

100 years

Tinned can
80 - 100 years

50 years

Leather shoe
40 - 50+ years

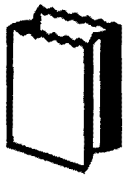
Wood
10 - 15 years

10 years

Wool sock
1 year

1 year

Cotton rag
5 months



Paper bag
1 month

Banana peel
3 -4 weeks